

KITOI BAY HATCHERY ANNUAL MANAGEMENT PLAN, 2002

By

James N. McCullough
and
Andrew W. Aro

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AUTHORS

James N. McCullough is the Region IV Resource and Development Biologist, Alaska Department of Fish and Game, Division of Commercial Fisheries, 211 Mission Road, Kodiak, Alaska 99615.

Andrew W. Aro is the Kitoi Bay Hatchery Manager, an employee of the Kodiak Regional Aquaculture Association, Kitoi Bay Hatchery, PO Box KKB, Kodiak, Alaska 99697.

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KITOI BAY HATCHERY ANNUAL MANAGEMENT PLAN
EXECUTIVE SUMMARY, 2002

New Projects for 2002: KBH will assume all Little Kitoi Lake field operations after 1 July.

Cost Recovery Harvests for 2002: NONE

Salmon Adult Returns, Stocking, and Egg Take Goals (2003 Stocking Goals), 2002:

Stocking Location (Broodstock)	2002 Projected Enhanced Return	2002 Stocking Plan	Goals	
			2002 Eggs	2003 Stocking
Kitoi Bay pink (BKC)	4,827,000	142,000,000 ^a	185,000,000	142,000,000 F
Kitoi Bay chum (BKC)	108,200	21,000,000 ^a	25,000,000	22,000,000 F
Kitoi Bay coho (BKC)	129,435	1,040,000 ^b	1,300,000	1,000,000 S
Little Kitoi Lake coho (BKC)	500	0	0	0
Jennifer Lake coho (BKC)	3,260	250,000 ^a	300,000	250,000 F
Ruth Lake coho (BKC)	0	30,000	60,000	50,000 F
<hr/>				
Total coho return to Kitoi Bay area	133,195			
Crescent Lake coho (BKC)	6,600	165,000	236,000	165,000 F
Katmai Lake coho (BKC)	1,500	15,000	21,000	15,000 F
Little Kitoi Lake sockeye (SL)	7,300	250,000 ^{ac}	300,000	250,000 PS

Broodstocks: BKC - Big Kitoi Creek (Kitoi Bay Hatchery); SL - Saltery Lake.

Life stage: F - Fry or Fingerling; PS - Presmolt; S - Smolt

^a Brood Year 2001

^b Brood Year 2000

^c 250,000 presmolt will be stocked in the fall of year 2002 from the brood year 2001 fish.

^d An estimated 2,800 will be of SL stock; an additional 900 early-run salmon are from a Pillar Creek Hatchery releases. (S. Honnold, ADF&G, Kodiak, personal communication).

Summary of active FTPs issued to KRAA for Kitoi Bay Hatchery 2002 and 2003 stocking:

Project Name FTP Number	Issue Date	Expiration Date	Purpose
Kitoi Bay Pink 01A-0102	9/1/01	8/30/06	Allows Big Kitoi Creek (BKC) pink salmon egg take of 215,000,000 green eggs and release of up to 182,000,000 fry into Big Kitoi Bay.
Kitoi Bay Chum 01A-0103	9/1/01	8/30/06	Allows BKC chum salmon egg take of 25,000,000 green eggs and release of up to 22,000,000 fed fry into Big Kitoi Bay.
Kitoi Bay Coho 02A-0007	5/01/02	5/01/12	Allows BKC coho salmon egg take of 1,300,000 green eggs, to be incubated and reared at KBH and the release of 1,000,000 20 g smolt into Big Kitoi Bay.
Jennifer Lake Coho 02A-0009	5/01/02	5/01/12	Allows BKC coho salmon egg take of 300,000 green eggs to be incubated and reared at KBH and the release of 250,000 fingerlings into Jennifer Lake.
Ruth Lake Coho 02A-0011	5/01/02	5/01/12	Allows BKC coho salmon egg take of 60,000 green eggs to be incubated and reared at BKH and the release of 50,000 fingerlings into Ruth Lake.
Crescent Lake Coho 02A-0008	5/01/02	5/01/12	Allows BKC coho salmon egg take of 600,000 green eggs to be incubated and reared at BKH and the release of 500,000 fingerlings into Crescent Lake.
Katmai Lake Coho 02A-0010	5/01/02	5/01/12	Allows BKC coho salmon egg take of 40,000 green eggs to be incubated and reared at BKH and the release of 30,000 presmolt into Katmai Lake.
Little Kitoi Sockeye 97A-0068	9/1/97	12/31/08	Allows Saltery Lake (SL) egg take of 1,200,000 green eggs and transfer, incubation and rearing of up to 300,000 presmolt and 600,000 smolt at Kitoi Bay Hatchery.
Little Kitoi Sockeye 97A-0069	10/15/98	8/31/09	Allows Saltery Lake sockeye release of 300,000 presmolt into Little Kitoi Lake
Spiridon Sockeye 02A-xxxx	2002	2007	Allows the transfer of up to 2,000,000 eyed eggs of Saltery stock from Pillar Creek Hatchery to Kitoi Bay Hatchery if water problems occur at Pillar Creek Hatchery

Bold denotes FTPs that will expire or will need changes prior to 2002 egg takes and 2003 outstockings (e.g., a Spiridon sockeye permit needs to be acquired if a transfer of juvenile fish occurs).

	2000				2001				2002								2003														
Species	Sep	Oct	Nov	Dec	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Oct	And Beyond
<u>Pink Salmon: Big Kitoi Creek Brood Stock</u>																															
Releases: Big Kitoi Bay							199 M Eggs									142 M Fry			185 M Eggs										142 M Fry		
<u>Chum Salmon: Big Kitoi Creek Brood Stock</u>																															
Releases: Big Kitoi Bay							27.7 M Eggs									21 M Fry			25 M Egg										22 M Fry		
<u>Coho Salmon: Big Kitoi Creek Brood Stock</u>																															
Releases: Big Kitoi Bay	1.3 M Eggs															1.04 M Smolt															
							1.3 M Eggs																						1.0 M Smolt		
																			1.3 M Eggs										1.0 M Smolt -6/03		
Releases: Jennifer Lake							0.300 M Eggs									0.250 M Fingerlin;			0.300 M Eggs									0.250 M Fingerling			
Releases: Ruth Lake																			0.060 M Eggs									0.050 M Fingerling			
Releases: Crescent Lake							0.236 M Eggs									0.165 M Fed Fry			0.236 M Eggs									0.165 M Fed Fry			
Releases: Katmai Lake							0.021 M Eggs												0.015 M Fingerling									0.021 M Eggs		0.015 M Fingerlings	
<u>Sockeye Salmon: Saltery Lake Brood Stock</u>																															
Releases: Little Kitoi Lake	0.3 M Eggs						.25 M Presmolt																								
							0.3 M Eggs												.25 M Presmolt												
																		0.3 M Eggs											0.25 M Presmolt		

ABSTRACT

Kitoi Bay Hatchery (KBH) was constructed in 1954 by the United States Department of the Interior. The facility was destroyed in the 1964 earthquake and was rebuilt in 1965 by the Alaska Department of Fish and Game. Currently, the facility is financed and operated by the Kodiak Regional Aquaculture Association. KBH is located about 30 air miles north of the city of Kodiak. The hatchery has the capacity to incubate 244 million salmon eggs and rear up to 180 million juveniles of all life stages. Currently, KBH incubates and rears a single stock of each of the following salmon species: pink *Oncorhynchus gorbuscha*, chum *O. keta*, coho *O. kisutch*, and sockeye *O. nerka*.

In 2002 about 142,000,000 pink salmon fry of Kitoi Bay broodstock will be released into Kitoi Bay. Prior releases of this broodstock are expected to produce a return, in 2002, of 4,827,000 adult pink salmon. Egg takes this fall will require about 185,000,000 eggs for future pink salmon releases.

In 2002 about 21,000,000 chum salmon fry of Kitoi Bay broodstock will be released into Kitoi Bay. Prior releases of this broodstock are expected to produce a return, in 2002, of about 108,200 adult chum salmon. Egg takes this fall will require about 25,000,000 eggs for future chum salmon releases.

In 2002 about 1,500,000 juvenile coho salmon of Kitoi Bay broodstock will be released into Kitoi Bay and four lakes. Prior releases of this broodstock are expected to produce a return in 2002, of about 133,195 adult coho salmon. Egg takes this fall will require about 2,300,000 eggs for future coho salmon releases.

In 2002 about 250,000 sockeye salmon presmolt of Saltery Lake broodstock will be released into Little Kitoi Lake. Prior releases of this stock and others are expected to produce a return, in 2002, of about 7,300 adult sockeye salmon. Egg takes this fall will require about 307,000 eggs for future sockeye salmon releases.

There are no cost recovery projects planned for this facility in 2002.

INTRODUCTION

Kitoi Bay Hatchery (KBH) is located on Afognak Island (58°11.04' N lat., 152°21.04' W long.) on the west side of Izhut Bay approximately 30 air miles north of the city of Kodiak (Figure 1). The facility was constructed in 1954 by the United States Department of the Interior, Fish and Wildlife Service, but was destroyed in the 1964 earthquake and then rebuilt by the Alaska Department of Fish and Game (ADF&G) in 1965. The hatchery was initially designed as a sockeye salmon *Oncorhynchus nerka* research facility; in 1976 the emphasis switched to pink salmon *O. gorbuscha* production. The present goal of the facility is to provide enhanced salmon fishing opportunities for the Kodiak common property fisheries by increasing the returns of sockeye, coho *O. kisutch*, pink, and chum *O. keta*, salmon primarily to the Kitoi Bay area (Figures 2 and 3). KBH was designed to increase salmon production for Kodiak Island commercial seine and set gillnet fisheries. Secondary user groups (in terms of the number of salmon harvested) to benefit from the hatchery production includes subsistence and recreational fishers. KBH has the capacity to incubate 244 million salmon eggs and rear up to 180 million juveniles of all life stages (fry, fingerling, presmolt, and smolt). Funding for the hatchery was provided exclusively by ADF&G prior to fiscal year (FY) 87, and was provided jointly by ADF&G and Kodiak Regional Aquaculture Association (KRAA) from FY87-FY91. The hatchery has been fully funded by KRAA since FY92.

KBH is primarily a site-specific production facility raising four species of juvenile salmon (sockeye, coho, pink, and chum salmon). The majority of eggs are collected and incubated on-site and resultant juveniles of all lifestages are reared and released at the hatchery. The majority of the returning adults are caught in the Duck, Izhut, and Inner and Outer Kitoi Bays Sections of the Afognak District by Kodiak's commercial salmon net fishers (Figures 2 and 3).

Big Kitoi Lake (BKL) supplies KBH with water through two 35.6 cm pipelines (Figure 4). The deep pipeline extends into BKL approximately 366 m and draws water from a depth of 21.3 m, supplying the hatchery with constant 4.0°C water. The shallow pipeline draws water from a depth of 4.6 m, supplying water with temperatures ranging from 0.5° to 16°C. These pipelines connect to a manifold allowing the hatchery to control water temperatures in any part of the hatchery.

Excess lake water drains from BKL through Big Kitoi Creek (BKC; Figure 4). BKC contains a barrier falls approximately 550 m upstream from salt water and 180 m downstream from BKL. The falls prevent adult salmon escapement into BKL. The mouth of BKC is adjacent to KBH. A weir is located at the mouth of the creek where pink salmon egg takes occur. Coho and chum salmon ascend a fish ladder at the weir and enter two raceways adjacent to the hatchery facility where their egg takes occur.

Little Kitoi Lake (LKL) is located approximately 0.8 km north of KBH (Figure 4). LKL drains through concrete raceways and a fish pass (Alaskan Steeppass type) system located at the outlet of LKL. All returning adults must pass through this system before entering the lake. The raceways are designed to control movement of both adult and smolt salmon, enabling the single system to monitor escapement and outmigration simultaneously. Smolt emigrate through the

raceways into a pipeline bypass adjacent to the adult fish pass. The fish pass and outmigration pipeline drain directly into Little Kitoi estuary.

The development of a pink salmon brood source began at the hatchery in 1976 using donor stock from a small run to Big Kitoi Creek. Pink salmon are the only salmon species indigenous to Big Kitoi Creek. The program expanded from approximately five million eggs in 1976 to 215 million eggs in 1989, and remains near this level (Tables 1 and 2). Recent increases in green-egg to eyed-egg survival has lowered the pink salmon egg take requirement to 185 million eggs (Table 2). All pink salmon eggs are collected from broodstock returning to Big Kitoi Creek and are incubated at KBH. The resultant pink fry are reared in saltwater net pens adjacent to the hatchery for a period of eight weeks prior to release into Kitoi Bay. In 2002 we propose continuing the KBH pink salmon program at full production (approximately 142 million fry release in 2003).

In 1980 a chum salmon broodstock program began using Sturgeon River stock. Since 1986 runs to the hatchery have been adequate to collect broodstock from Big Kitoi Creek, but the hatchery production goal of 25 million eggs (a 22 million fry release) was not achieved until the early 1990s. The chum salmon program has been impacted by disease problems, which decreased production during some years. In 1991 (brood year 1990) an infectious hematopoietic necrosis virus (IHNV) outbreak resulted in a complete brood year failure. Later in 1991 ultraviolet (UV) light water disinfecting units were installed in the hatchery to sterilize all incubation water in an effort to prevent further disease outbreaks. The UV water treatment has been successful; no outbreaks of IHNV have occurred in chum salmon since it was installed. From 1999 through 2001, full chum salmon production was achieved. Chum salmon fry produced at the hatchery are reared in saltwater net pens adjacent to the hatchery for a period of four to ten weeks prior to release into Kitoi Bay. In 2002 we propose continuing the KBH chum salmon program at full production (a release of about 22 million fry in 2003).

A coho salmon fry remote release program was started at KBH in 1982 using Buskin and Little Kitoi Lake (LKL) wild stocks. The fry were released into a number Kodiak road system lakes and a portion were back stocked into Buskin and Little Kitoi Lakes. In 1990 coho salmon fingerlings were released into Kitoi Bay (wild LKL stock) to develop a hatchery broodstock returning to Big Kitoi Creek and to increase the commercial harvest in the Kitoi Bay area. Since 1993 coho salmon runs have been adequate for hatchery egg takes and have provided enough eggs to reach production goals (about 2.3 million). The majority of resulting fry are reared to smolt at the hatchery; however, some juveniles are released into local lakes in the Kitoi Bay area (Jennifer and Ruth Lakes; Figure 4). In the spring coho salmon fingerlings are also stocked into Crescent Lake (adjacent to Port Lions; Figure 5) and in the fall fingerlings are stocked into Katmai Lake (adjacent to Ouzinkie village; Figure 1). These projects have created coho salmon subsistence fisheries for the villages of Port Lions and Ouzinkie. In addition, the Katmai Lake stocking provides an educational project for local school students that assist with the stocking. We propose continuing the coho salmon fingerling and smolt release program in 2002 at similar release levels as in 2001 (about 1.5 million combined fry/fingerling/smolt).

A pilot project was initiated in 1989 and continued through 1994 to develop a late-run sockeye salmon broodstock that would return to LKL. This program was designed to utilize an age 0. component of the late-run Upper Station Lake sockeye salmon stock. These fish were thought to

require only a few weeks of freshwater rearing; adult returns could be expected sooner than if reared for the normal 1-2 years in freshwater. This project was intended to develop a brood source at LKL to provide sockeye eggs for incubation and short-term fry rearing at Pillar Creek Hatchery (PCH; McCullough et al. 2001; McCullough and Aro 2001) with resultant fry stocked into Spiridon Lake. The project was modified in 1993 to produce presmolt and smolt due to unsatisfactory survival from the age 0 releases. Adult returns to LKL have not been adequate to supply PCH with eggs or to increase releases at KBH for broodstock development.

Research by ADF&G and the U.S. Fish and Wildlife Service (FWS) concluded that SALTERY Lake sockeye salmon, as opposed to late-run Upper Station sockeye salmon, is preferred for Spiridon Lake and LKL stocking (Clevenger et al. 1997; Honnold 1997). The run timing of SALTERY Lake sockeye salmon is earlier than the Upper Station stock, and the use of SALTERY Lake stock should increase broodstock available because the SALTERY stock should return after the peak of the chum salmon fishery and before the pink and coho salmon runs (Figure 6). This run timing is expected to improve the sockeye salmon escapement into LKL. We identify production requirements in this plan using SALTERY Lake sockeye salmon as the sockeye salmon stock for broodstock development.

The LKL SALTERY Lake sockeye salmon stock releases began with a release of smolt in the spring of 1999 (brood year 1997; BY 97). Low numbers of spring outmigrants from LKL led to an experiment where half of the BY 98 sockeye salmon were released in the fall of 1999 and the other half in the spring of 2000. These releases were differentially fin clipped to determine their survival rates and emigration timing. Results from the fin clipping studies indicated that the most successful releases, in terms of the number of smolt produced, occurred from the fall stocking (S. Schrof, ADF&G, Kodiak, personal communication; fin clip data were used for age analysis because the scale pattern analysis has been inconclusive). In 2000 fall hydroacoustic surveys determined that some of the LKL stocked juvenile fish held over another winter in the lake (instead of smolting about 80,000-100,000 fish remained in the lake). In 2001 a hydroacoustic survey determined that the number of hold-overs were approximately half that of the previous year (38,000). The 2001 spring outmigrants were over 95% age one sockeye; thus the LKL fall presmolt stocking appears to be the best management practice. Future stocking of LKL will rely on fall presmolt releases.

During the 1964 earthquake saltwater entered LKL. Over the following years, hydrogen sulfide developed within the three basins at the bottom of LKL. This hindered the productivity of the lake, so in 1995 an 8-inch pipeline was sunk into the lake and most of the hydrogen sulfide was siphoned off. Although a small amount of hydrogen sulfide remains, the zooplankton levels immediately showed signs of improvement. LKL was fertilized in 2000-2001 and increased zooplankton levels have been observed each consecutive year (S. Honnold, ADF&G, Kodiak, personal communication). Although budget constraints have discontinued the fertilization program, limnological data will continue to be collected and analyzed annually to determine zooplankton and stocking levels.

We propose to continue the SALTERY Lake sockeye salmon egg take, conducted by Pillar Creek Hatchery staff, and in 2002 the October release of 250,000 sockeye salmon presmolt into LKL.

The egg take season at KBH occurs from early July through November (Figure 6). The chum salmon egg takes, with a goal of 25 million eggs, starts in early July and runs through early August. The pink salmon egg takes, with a goal of 185 million eggs, starts in early September and runs through the third week of September. The season ends with the coho salmon egg takes, which occur from late October through November. The coho egg take goal is about 2.3 million eggs. A LKL sockeye salmon egg take will not occur until 2003 when the run is expected to be 100% Saltery Lake stock. The LKL sockeye salmon egg take should occur from mid to late September.

In 2002 or 2003, due to work planned on the Pillar Creek Hatchery water reservoir, it may be necessary to transfer up to two million eyed Saltery Lake sockeye salmon eggs to KBH (McCullough and Clevenger 2002). These eggs would be incubated and the resulting fish reared at KBH for release into Spiridon Lake.

This management plan will continue to evolve until all program objectives are reached. Inseason assessments and project approvals by the KRAA, the ADF&G, or the FWS may result in changes to this document in order to reach or maintain program objectives.

2001 BROOD YEAR: RELEASES IN 2002 AND 2003

Table 1 describes 2001 egg takes, planned releases in 2002 and 2003, projected returns in 2003-2006, and the status of Fish Transport Permits (FTP). Appendix A describes survival estimates used to project production. Appendices B - F list KBH historical releases for pink, chum, coho, and sockeye salmon, respectively.

Pink Salmon: Kitoi Bay Hatchery (Big Kitoi Creek) Stock

In 2002 we plan to rear and release 142 million 0.65 g pink salmon fry directly into Kitoi Bay (Figures 3 and 4). The fry are volitionally released from the hatchery via pipelines into saltwater net pens and reared in saltwater for a period of three to eight weeks and then released into Kitoi Bay. The egg-to-fry survival estimate is used as the baseline for the actual stocking levels (Appendix A).

About 4,970,000 adult pink salmon are expected to return to KBH in 2003 from this release (Table 1). The pink salmon run should begin in late July, peak in early August and end in late August (Figure 7). Most pink salmon returning to KBH will be harvested in the commercial salmon fishery in Izhut, Duck and Kitoi Bays Sections (Figure 3).

Chum Salmon: Kitoi Bay Hatchery (Big Kitoi Creek) Stock

In 2002 we plan to rear and release 21 million 1.75 g chum salmon fry directly into Kitoi Bay (Figures 3 and 4). The fry are volitionally released from the hatchery via pipelines into saltwater net pens and reared in saltwater for a period of four to 12 weeks. The actual stocking levels are estimated by egg-to-fry survivals (Appendix A).

Approximately 420,000 adults are expected to return from the 2002 release beginning in 2004 and continuing through 2006. The age 0.3 chum salmon (three years ocean residence) historically comprise the majority of the run (Hall et al. 1997). In 2002 we will continue with the collection of chum salmon harvest data (scales) throughout the run to develop a more complete and representative age class record. Chum salmon runs into Kitoi Bay usually begin in early June, peak in mid June to early July and end in early August (Figure 7). Most chum salmon returning to KBH will be harvested in the commercial salmon fishery in the Duck, Izhut and Kitoi Bays Sections (Figure 3).

Coho Salmon: Kitoi Bay Hatchery (Big Kitoi Creek) Stock

In 2002 we plan to release 1,040,000 22.0 g age 1. coho salmon smolt (BY 00, Big Kitoi Creek brood source) directly into Kitoi Bay (Figures 3 and 4). Initial imprinting occurs prior to transfer into saltwater, while smolt are still in the hatchery freshwater raceways. The smolt are transferred from the hatchery via pipelines into saltwater net pens and reared for about four weeks to provide additional time for imprinting and osmoregulation. The saltwater net pens are located in the vicinity of the Big Kitoi Creek discharge (KBH water source), which is intended to provide further imprinting opportunities (McCullough and Aro 2001). The average survival from smolt released to adult return to Big Kitoi has been about 13.9% (Appendix A). We expect approximately 145,000 adults to return in 2003 as age 1.1 coho salmon (Table 1).

In 2002 we also plan remote releases in the Kitoi Bay area of 250,000 0.75 g coho fingerlings (BY 01 Big Kitoi Creek brood source) into Jennifer Lake (Table 1; Figure 4). Jennifer Lake is a barren lake with a fish barrier near tide water. About 5,000 adults are expected to return in 2004 from this release (Table 1). We also plan to release 50,000 0.75 g coho fingerlings (BY 01 BKC stock) into Ruth Lake in 2002. The Ruth Lake release did not occur in 2001 due to low zooplankton levels observed in 2000. Stocking levels for each lake are determined by analysis of limnological data.

Coho salmon runs into Kitoi Bay usually begin in early August, peak in mid to late August and end in early September (Figure 7). Most coho salmon returning to KBH should be harvested in the commercial salmon fishery in the Duck, Izhut, and Kitoi Bays Sections (Figure 3).

In 2002 we also plan remote releases of 165,000 0.75 g coho fingerlings into Crescent Lake (Port Lions village area; Figure 5) and 15,000 7.0 g coho presmolt into Katmai Lake (Ouzinkie village, Figure 1, Table 1). Crescent Lake stocking levels were estimated by limnological analysis. Katmai Lake stocking levels were estimated by modeling the surface area of the lake (limnology samples are not collected). The Katmai Lake release of presmolt in October is

expected to minimize impacts to the lakes' forage base. Remote releases into Crescent and Katmai Lakes have occurred annually since 1987. Adult returns (BY 01) are projected to be 3,300 to Crescent Lake and 1,500 to Katmai Lake in 2004 (Table 1). The residents of each neighboring village primarily harvest these salmon during sport and subsistence fisheries. A portion of the Crescent Lake run may be available for commercial harvest in the Northwest Kodiak District (Figure 2) and the Crescent Lake Terminal Harvest Area (Figure 5; Alaska Administrative Code Chapter 18.364: 5 AAC 18.364).

All juvenile coho salmon stocked into lakes are transported to each site by floatplane using transfer tanks.

Sockeye Salmon: Saltery Lake Stock

In 2002 we plan to release 250,000 sockeye salmon presmolt (BY 01, Saltery Lake brood source) into Little Kitoi Lake (Table 1). The release strategy will continue to be large fall presmolt as this has been determined to be the most successful life stage for stocking (S. Schrof, ADF&G, Kodiak, personal communication). Approximately 10 percent of this release will be marked by fin clipping (see Evaluation Section). The juveniles will be transported to LKL by transfer tank installed on a skiff and then hauled up the LKL fish pass by bucket and released directly into LKL.

Approximately 12,500 adults are expected to return in 2005 and 2006 from BY 01 releases (Table 1). The returning adults are expected to have similar run timing as Saltery Lake sockeye salmon with the initial run beginning in late June, peaking in mid to late July and ending in mid August (Figure 8; Honnold 1997). The run timing is earlier than Upper Station sockeye salmon stock which should make broodstock collection easier since the Saltery Lake stock should return after the chum salmon fishery and prior to most of the pink salmon. This return timing is expected to reduce their harvest in the common property fishery and increase escapement into LKL.

In summary, we propose releasing the following juveniles in 2002: 142 million pink salmon fed fry, 21 million chum salmon fed fry, 1,040,000 coho salmon smolt, 445,000 coho fingerlings, 15,000 coho presmolt, and 250,000 sockeye salmon presmolt (Table 1). In addition, we propose releasing 1,000,000 coho smolt in 2003 from our BY 01 egg take (Table 2).

2002 BROOD YEAR: RELEASES IN 2003 AND 2004

Table 2 describes 2002 egg takes, planned releases in 2003-2004, projected returns for 2004-2007, and the status of Fish Transport Permits. Appendix A describes survival estimates used to project adult production.

Pink Salmon: Kitoi Bay Hatchery (Big Kitoi Creek) Stock

In 2003 we intend to release 142 million 0.65 g pink salmon fry into Kitoi Bay (Table 2). At this time, a pink salmon release of this magnitude would be at KBH's maximum capacity. The actual number may be less depending on how many chum salmon eggs are collected and the egg to fry survival of both species (Appendix A). Pink and chum salmon production is limited by the hatchery eyed-egg incubation space (ADF&G hatchery operating permits are based on green-eggs). The total pink and chum salmon incubation space is about 190 million eyed-eggs. The chum salmon run and associated broodstock collection occurs prior to the pink salmon run and broodstock collection (Figures 6 and 7). If the maximum chum salmon egg take occurs and results in about 25 million eyed-eggs, incubation space will not be available for a maximum pink salmon egg take. If the chum salmon egg take results in less than 25 million eyed-eggs, additional incubation space will be available for the pink salmon egg take up to the permitted maximum of 215 million green-eggs (resulting in about 190 million eyed-eggs).

Approximately 4.97 million adult pink salmon are expected to return to KBH in 2004 (Table 2). The pink salmon run is expected to begin in late July, peak in early August and end in mid to late August (Figures 6 and 7).

Chum Salmon: Kitoi Bay Hatchery (Big Kitoi Creek) Stock

In 2003 we intend to release 22 million 1.7 g chum salmon fry into Kitoi Bay (Table 2). The actual number released will depend on the number of eggs collected and the egg to fry survival (Appendix A). If KBH's maximum chum salmon egg capacity is achieved (25 million), about 22 million chum salmon fry should be produced.

From the 2003 release about 440,000 chum salmon adults are expected to return in 2005-2007. The majority of the return is expected in 2006 as age 0.3 chum salmon (three years ocean residence; McCullough and Aro 2000). The run is expected to begin in early June, peak in mid June to early July and end in mid to late July depending on run strength (Figures 6 and 7).

Coho Salmon: Kitoi Bay Hatchery (Big Kitoi Creek) Stock

In 2003-2004 we intend to release about 1,480,000 juvenile brood year 2002 coho salmon of Big Kitoi Creek brood stock (fingerlings in 2003 and smolt in 2004). The releases will occur in Kitoi Bay and three freshwater lakes (Table 2).

In the Kitoi Bay area in 2003 we plan to release 250,000 0.75 g coho fingerlings (BY 02) into Jennifer Lake and 50,000 0.75 g coho fingerlings into Ruth Lake (Table 2; Figure 4). The fingerlings will be transported from the hatchery to the lakes by float plane and transfer tank. Both lakes are barren with a barrier falls. The stocking levels will be determined by limnological analysis.

In 2003 we also plan to release 165,000 0.75 g coho salmon fingerlings into Crescent Lake (Port Lions village; Figure 5) and 15,000 7.0 g coho presmolt into Katmai Lakes (Ouzinkie village; Figure 1).

The release in Kitoi Bay in 2004 will consist of 1,000,000 20.0 g age 1. smolt (BY 02). The smolt will be reared and released in a manner similar to the 2003 coho smolt release.

About 10,800 adults are expected to return in 2005 from fingerlings and presmolt stocked in 2003 and an additional 139,000 adults from smolt stocking in 2004 (Table 2). Of these 139,000 returning adults in 2005, about 133,000 will be available for harvest, in the Kitoi Area (Izhut, Duck, and Kitoi Bays Sections; Figure 3), and 6,000 will be needed for broodstock, due to sea lion and other mortality factors. Adult returns are projected to be 3,300 to Crescent and 1,500 to Katmai Lake in 2005 and will primarily be harvested in sport and subsistence fisheries by the residents of each neighboring village. These coho salmon runs should begin in early August, peak in mid to late August and end in early September (Figure 7).

Sockeye Salmon: Saltery Lake Stock

In 2003 we intend to release 250,000 Saltery stock presmolt sockeye into LKL in a manner similar to the 2002 releases. The actual number released will be determined after annual limnological analysis of the lake. About 12,500 adults are expected to return in 2006 and 2007 from this release. The returning adults are expected to have similar run timing as Saltery Lake sockeye salmon with the initial run beginning in late June, peaking in mid to late July and ending in mid August (Figures 6-8; Honnold 1997).

In summary, we expect the following releases and production from brood year 2002 egg takes. A release of 142 million pink salmon fry producing 4.97 million adults, 22 million chum salmon fry producing 440,000 adults, 1,000,000 coho smolt producing 139,000 adults, 460,000 coho fingerlings and presmolt producing 10,400 adults and 250,000 sockeye presmolt producing 12,500 adults (Table 2).

SALMON HARVEST MANAGEMENT

The estimated run, and harvest of salmon returning to systems in 2002 as a result of prior KBH stocking is presented in Appendix G.

Release Site: Kitoi Bay Hatchery

The Kitoi Bay harvest strategy is described in the Eastside Afognak Management Plan (5 AAC 18.365). The harvest strategy is designed to increase fishing opportunities for the commercial salmon net fishery in the Duck, Izhut, and Kitoi Bays Sections (Figure 3) while providing for adequate broodstock escapement to KBH. Most of the salmon returning to KBH are harvested in

these sections. It is recognized that a joint effort between the ADF&G and the KRAA is necessary to continue operation of the hatchery at full production levels. Inseason management of KBH salmon runs is complicated because of overlapping run timing between species and the escapement priority given to broodstock (Figures 6-8).

Priority will be given to broodstock goals; therefore, inseason adjustments in fishing opportunities in any or all management units may be necessary (Table 3). These compromises may occur more frequently in the Kitoi Bay Sections and least frequently in the Duck Bay Section. Broodstock collection schedules will maintain the genetic diversity of returning salmon at KBH and allow future harvest in the common property fishery (Figure 3). During the broodstock collection periods, the burden of achieving adequate broodstock escapement while maintaining high quality harvests on hatchery bound returns will be shared by the Kodiak Area Management Biologist and the Kitoi Bay Hatchery Manager.

Kitoi Bay Special Harvest Area (SHA) is defined as the Inner Kitoi Bay Section ("inside the jaws"; Brennan et al. 2002; Figure 4). Cost recovery fisheries occurred in the SHA in 1987, 1988, and 1989 but are not expected to occur in 2002.

Pink Salmon

Pink salmon produced at KBH are mostly taken in commercial purse and beach seine fisheries in the Duck, Izhut, and Kitoi Bays Sections (Figures 3 and 4). Set gillnet fishers also benefit as a result of the relocation of a segment of the purse seine fleet to target Kitoi salmon. Natural stocks of pink salmon destined for the Westside of Kodiak Island and other Afognak Island systems may also contribute to the harvest.

The Kitoi Bay area is managed under the guidelines in the Eastside Afognak Management Plan (5 AAC 18.365). Depending on run strength (2002 forecast is 4,827,000 pink salmon; Appendix G) there will be an opening in late July to harvest excess males which usually arrive during the early portion of the run. In order to harvest pink salmon in excess of the hatchery broodstock needs (332,000; Table 3), additional openings in this area may occur. It is an egg take objective that the brood fish sex ratio be at least 60% female and for the egg takes to occur over a four-week period, to ensure the stock's genetic diversity.

Depending on run strength and timing, the Inner and Outer Kitoi Bay Sections may close to commercial salmon fishing from August 8 through August 16 to allow for pink salmon broodstock escapement (Figures 3 and 7). Most pink salmon brood is collected by mid August. If further closures are needed to ensure adequate broodstock, the Izhut and Duck Bay Sections may also close to commercial salmon fishing. Once the pink salmon broodstock is collected and contained behind the barrier net enclosure (Figure 4), additional commercial fishing time may be allowed inside Kitoi Bay. Fishing periods are coordinated between the Kitoi Bay Hatchery Manager and the Kodiak Area Management Biologist to ensure adequate brood fish. Big Kitoi Creek pink salmon escapement is monitored at a weir. Escapement goals have not been formally established for Big Kitoi Creek; however, about 15,000 pink salmon annually spawn in the creek (Table 3). Coordinated management of the fisheries and broodstock collection has been effective.

Chum Salmon

Chum salmon produced at KBH are taken in commercial purse seine fisheries in the Izhut, Duck and Kitoi Bays Sections (Figure 3). In 2002 chum salmon returns to Kitoi Bay are projected at 108,200 total adults (Appendix G). Chum salmon broodstock requirements for KBH are 28,000 fish (Table 3); therefore, a commercial fishery targeting chum salmon is expected in the Izhut, Duck, and Kitoi Bays Sections in 2002.

The chum salmon return begins in early June, peaks in late June to early July, and ends in early August (Figure 7). Most of the chum salmon needed for broodstock are expected to be in Inner Kitoi Bay Section by mid July (Figures 3 and 4). The chum salmon egg take is expected to occur from early July through early August. In 2001 a volunteer seine boat was utilized to help corral stubborn broodstock toward the entrance of the brood holding area. This herding technique was successful and, assuming continued volunteer support, the technique will be used again in 2002 to improve chum brood collection at KBH.

Chum salmon commercial openings in the Duck, Izhut, and Kitoi Bays Sections typically occur on June 9. In order to harvest adults in excess to hatchery broodstock needs, additional openings in these sections may occur as run strength is determined. The Kitoi Bay area will be managed under the guidelines in the Eastside Afognak Management Plan (5 AAC 18.365). The major harvest areas are Duck, Izhut, and Kitoi Bays Sections (Figure 3). The Hatchery Manager and the Kodiak Area Management Biologist will coordinate openings in the Duck, Izhut, and Kitoi Bays Sections to minimize the harvest of chum salmon during the June sockeye salmon and late July pink salmon fisheries. Brood fish are retained by a barrier net enclosure in the Kitoi Bay estuary (Figure 4). Once all chum salmon broodstock are contained behind the barrier net, additional commercial fishing time may occur inside Kitoi Bay. Big Kitoi Creek chum salmon escapement is monitored at a weir. Escapement goals have not been formally established for Big Kitoi Creek; however, each year, on average, about 2,000 chum salmon in excess of broodstock needs have escaped into the creek (Table 3).

Coho Salmon

Coho salmon produced at KBH are harvested in commercial purse and beach seine fisheries and contribute to the catch in the Duck, Izhut, and Kitoi Bays Sections (Figure 3). About 6,000 coho salmon are required for broodstock (Table 3). The Little Kitoi Lake (LKL) minimum escapement goal is 500 fish and the adult run forecast is about 133,000 (Appendix G); therefore, a commercial fishery targeting excess coho salmon is expected in the Kitoi Bay area in 2002.

The coho salmon run is expected to start in late July, peak in late August, and continue through the beginning of September (Figures 6 and 7). The majority of the coho will be harvested incidental to the pink salmon fishery in the Kitoi area as well as in directed coho fisheries in late August and early September. The Kitoi Bay area will be managed under the guidelines in the Eastside Afognak Management Plan (5 AAC 18.365). Hatchery broodstock will be collected throughout the coho salmon run. In the past, a specific commercial fishing closure has not been necessary to ensure adequate broodstock. The run strength in 2002 is estimated to be

substantially larger than broodstock requirements; therefore, specific commercial fishing closures are not expected to occur. Once all coho salmon broodstock are collected and contained behind the barrier net, an increase in commercial fishing time may occur inside Kitoi Bay.

A regulation intended to improve broodstock collection efforts near the hatchery describes three distinct areas where fishing is either prohibited year-round or restricted between August 15 and September 30 (Figures 3 and 4; 5 AAC 18.350; 5 AAC 64.022(b)). These closed waters areas are intended to provide for orderly broodstock collections and as a precautionary measure to resolve potential conflicts between hatchery broodstock needs and subsistence and recreational fisheries. Brood fish are retained by a barrier net enclosure in the Kitoi Bay Estuary (Figure 4). In some years a substantial number of coho salmon broodstock are lost to marine mammal and bear predation (McCullough and Aro 2001).

Release Site: Little Kitoi Lake/Estuary

Early-Run Sockeye

From June 9 through July 20 the Kitoi salmon harvest strategy is designed to achieve harvest objectives for salmon stocks of the Duck, Izhut, and the Inner and Outer Kitoi Bay Sections produced from the LKL early-run sockeye salmon enhancement project (Brennan et al. 2002; McCullough and Clevenger 2002). In 2002 the entire early run (900 fish from Pillar Creek stocking) will be available for harvest. The fish pass at the mouth of LKL will remain closed and commercial fishing will be allowed within Little Kitoi Bay (Brennan et al. 2002). The commercial fishing activity will prevent fish from straying while the fish pass is closed to sockeye escapement into LKL. This stock was originally developed as a backup brood source if escapements were too low at Afognak Lake to provide for early-run stocking projects. This goal was discontinued in 1998, as the Afognak Lake sockeye salmon run is expected to be large enough to provide eggs for all early-run stocking projects in the future (McCullough and Clevenger 2002).

The Kitoi Bay area will be managed by the guidelines in the Eastside Afognak Management Plan (5 AAC 18.365). The early-run sockeye (Afognak Lake stock) should begin in late May and continue through June (McCullough and Aro 2001). Commercial fishing will occur in early June to coincide with the early part of the chum salmon run. Additional short openings may occur in the Kitoi Bay area, depending upon the chum salmon run strength. Additional commercial fishing time may also occur inside Kitoi Bay once all chum salmon broodstock are collected and contained behind the barrier net.

Late-Run Sockeye

In 2002 all late-run sockeye salmon (7,300 fish of mixed Saltery and Upper Station stock from KBH; Appendix G) that return to LKL will be available for harvest. The fish pass at the mouth of LKL will remain closed throughout the late run (until approximately August 20 when coho salmon escapement begins) to prevent the sockeye salmon from entering LKL. This strategy is intended to eliminate the Upper Station stock, which is necessary to simplify development of the

Saltery Lake broodstock program. When sockeye salmon are present, commercial fishing may be allowed in the Inner Kitoi Bay Section (Figure 4).

The late sockeye salmon run should begin in late June and continue through mid August (Figure 7). The majority of the adults will be harvested incidental to the pink and coho salmon commercial fisheries. Once all pink salmon broodstock are contained behind the barrier net, additional commercial fishing time may occur in the Inner and Outer Kitoi Bay Sections.

Release Site: Jennifer, Ruth, and Little Kitoi Lake

Coho Salmon

The purpose of the Jennifer and Ruth Lakes coho salmon stocking projects is to provide enhanced coho salmon for harvest as they return to the Kitoi area (Figure 3). The Kitoi harvest strategy also protects Big Kitoi Creek escapement (brood source for the stocking of these lakes; Figure 4). Coho salmon returning to Jennifer and Ruth Lakes will be harvested during commercial fisheries in Duck, Izhut and Kitoi Bays Sections (Figure 3). All of the coho salmon bound for these lakes will be available for harvest; brood fish are not required at Jennifer or Ruth Lakes since they are a part of a remote release program from KBH. Jennifer and Ruth Lakes have barrier falls that prevent salmon escapement into the lakes. Fish that are not harvested at Jennifer and Ruth Lakes have access to the lower portion of the outlet streams so they are not expected to stray.

The LKL fish pass and weir will be closed until approximately August 20 to prevent sockeye salmon from escaping into the lake (see above sections for sockeye salmon). Coho salmon will be able to enter LKL after August 20 to provide escapement (range of 500-1,000 salmon) and to prevent straying. Although the coho salmon peak run timing is slightly later than the pink salmon peak most of the coho will be harvested during fisheries targeting pink salmon.

Release Site: Crescent Lake

Coho Salmon

The purpose of the Crescent Lake coho salmon stocking project is to provide enhanced coho salmon for harvest as they return to Crescent Lake (Figure 5; 5 AAC 18.364). Most of the 2002 coho salmon run will be harvested in the local sport and subsistence fishery; however, a portion of the run may be available for commercial harvest. The commercial harvest of Crescent Lake coho salmon is expected to occur during normal fishing periods targeting coho salmon in the Northwest Kodiak District (Figure 2). Special openings are not expected to occur within the Settler Cove Terminal Harvest Area (Figure 5). Crescent Lake does not require brood fish, escapement, or cost recovery, so all returning coho salmon will be available for harvest. Natural barriers prevent salmon access to the lake; however, fish that congregate in the outlet stream are prevented from straying since the villagers of Port Lions utilize the entire escapement for subsistence purposes. Harvest information will be monitored through subsistence permits issued to each fisher and commercial fish ticket data. Since 1998 the coho run to Crescent Lake has been less than expected, perhaps

due to the increased number of beaver ponds in the watershed preventing smolt access to saltwater. The 2002 run may also be less than the 6,600 salmon expected (Appendix G).

Release Site: Katmai Lake

Coho Salmon

The purpose of the Katmai Lake coho salmon stocking project is to provide adult returns for sport and subsistence harvest primarily by Ouzinkie Village residents (Figure 1). This project is also intended to provide students in the Ouzinkie Village with a community and educational project assisting in the release of the presmolt. Most coho salmon returning to Katmai Lake will be harvested in the local sport and subsistence fishery. Some may also be harvested in commercial fisheries in the Northwest Kodiak District (Figure 2). All returning coho salmon will be available for harvest; brood fish are not required. This is a barriered system, which prevents escapement into the lake; fish do not stray since the village residents harvest the entire escapement. Harvest data will be monitored through subsistence permits and commercial fish ticket data. The 2002 run is expected to be about 1,500 salmon (Appendix G).

General Conditions of Harvest Management, 2002

The primary objective of the KBH is to provide salmon for common property fisheries. It is recognized that a joint effort between the ADF&G and the KRAA is necessary to continue the operation of the hatchery at full production levels. The Kodiak Area Management Biologist manages all salmon fisheries. The fisheries are managed to ensure an adequate broodstock and orderly common property fisheries occur as announced by the Kodiak Area Management Biologist. Operation of the hatchery will maintain the genetic diversity of all broodstocks and allow future harvest in the common property fisheries.

Special Harvest Area Description, Conditions, and Harvest Strategies: KBH

The Kitoi SHA is defined as the Inner Kitoi Bay Section (Brennan et al. 2002; Figure 3). Funds received from the 1989 cost recovery will be used to operate the hatchery in FY 03. Common property fisheries will harvest all excess salmon over broodstock needs. Harvest information will be monitored through the ADF&G fish ticket information collected from each buyer. Due to the KBH location, the incidental catch of non-targeted salmon in the Kitoi Bay area should be insignificant.

2002 ESCAPEMENT GOALS AND BROODSTOCK REQUIREMENTS

KBH escapement goals for all species are described in Table 3. Adult pink, chum, and coho salmon returning to Kitoi Bay were imprinted on Big Kitoi Creek (hatchery water supply; Figure 4). Only

pink salmon are indigenous to Big Kitoi Creek. All returning salmon are initially prevented access to Big Kitoi Creek by a weir and a barrier falls that prevents the fish from entering Big Kitoi Lake. Pink and chum salmon are allowed to enter the creek and spawn to propagate the run in the event of the loss of the hatchery-reared fish. Pink and chum salmon eggs collected from salmon returning to Big Kitoi Creek/KBH will provide fry for release into Kitoi Bay in 2003. Coho salmon eggs collected from KBH will provide juvenile fish for release at Kitoi Bay, Crescent, Katmai, Jennifer, and Ruth Lakes in 2003 and 2004. Pink and chum salmon escapements include the number of salmon remaining in the creek after KBH has finished its egg takes. Little Kitoi Lake (LKL) sockeye escapement will not be required in 2002.

Saltery Lake sockeye replaced Upper Station as the late-run brood source in 1997 for enhancement and broodstock development. About 3,700 Saltery Lake sockeye salmon will be necessary in 2002 for PCH broodstock to continue the Spiridon Lake project (McCullough and Clevenger 2002). KBH will need an additional 250 adults for LKL broodstock development (presmolt releases). All egg takes will follow the criteria established in the Pillar Creek Hatchery Annual Management Plan (McCullough and Clevenger 2002).

ADDITIONAL MEASURES FOR WILDSTOCK PROTECTION

Genetics Policy

The ADF&G Genetics policy, as described in the 2001 Kitoi Bay Hatchery AMP (McCullough and Aro 2001), will be followed in 2002 for all projects.

Policies and Guidelines for Health and Disease Control

The State of Alaska Pathology Review Committee policy (McGee 1995) as described in the 2001 Kitoi Bay Hatchery AMP (McCullough and Aro 2001) will be followed in 2002 for all projects.

EVALUATION

Sockeye Salmon

The sockeye salmon evaluation program will focus on assessing production from LKL presmolt and smolt releases (Tables 1 and 2; S. Schrof 2002).

Since 1997 sockeye salmon studies on the return rate (degree of imprinting and survival) at Big Kitoi Creek and hatchery raceways, have been implemented. These studies will continue with an evaluation of age 1. sockeye smolt releases. All sockeye salmon observed in Big Kitoi Creek and the hatchery raceways, will be examined for marks and scales and fish lengths will be taken. Scales taken from adults without marks will be aged and the scale patterns will be compared to LKL

sockeye scale patterns. Any sockeye salmon found in the hatchery raceways will be killed, to prevent straying to other systems, and donated to charities.

The assessment of sockeye salmon stocking strategy by age and or size at release was also part of the original evaluation program in conjunction with a straying study (Hall et al. 1999; Schrof et al. 2000). The intent of these studies was to determine which stocking strategy was the most successful, in terms of adult production (Hall et al. 1999).

In 2002 a portion of the sockeye salmon released (10% of the fall release into LKL) will again be marked prior to release by fin clipping to determine the success of a given rearing strategy (S. Schrof 2002). Returning adult sockeye salmon will be examined for fin clips and sampled at LKL fish ladder and during Kitoi Bay Section commercial salmon openings. Fish will also be examined at the LKL fish pass although sockeye escapement into the lake will not be allowed.

Hatchery reared sockeye smolt will be sampled for biological data and tested for osmocompetence prior to release. Lake limnological surveys will continue at Little Kitoi, Jennifer, and Ruth Lakes and salinity, temperature, and plankton monitoring will also be conducted in Big and Little Kitoi Bays.

Chum, Coho, and Pink Salmon

In 2002 a total of 600 adult chum salmon from Big Kitoi Creek and an additional 600 from the Kitoi area commercial fisheries will be sampled for age and length data (S. Schrof 2002). These data will be used to assign ages to the adult chum salmon run and estimate overall survival by release year. Plankton tows will be conducted in Kitoi Bay to ascertain the timing of plankton blooms to assist with release timing of pink and chum salmon fry. Prior to saltwater rearing, coho salmon smolt will also be sampled for length data to track length frequency trends at release to compare with the magnitude of returning adults. The intent of this comparison is to determine if there is a release size, which optimizes survival and subsequent adult returns. Also, coho salmon smolt will be saltwater challenged to determine osmocompetence.

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Table 1. Salmon egg takes (2001), planned releases (2002-2003), projected returns (2003-2006), and fish transport permits (FTP), Kodiak Management Area.

Release Site	Egg Take		Releases			Adult Returns ^a					FTP			
	eggs	adults	Number	Size (g)	Date	2003	2004	2005	2006	Total	Number	Expires	Maximum No.	Life Stage
Pink Salmon: Kitoi Bay Hatchery Stock														
Kitoi Bay	199,751,144	331,927	142,000,000	0.65/FF	May-02	4,970,000	0	0	0	4,970,000	01A-0102	8/30/06	215,000,000	G.Eggs
											01A-0102	8/30/06	182,000,000	Fry
Chum Salmon: Kitoi Bay Hatchery Stock														
Kitoi Bay	27,700,188	27,683	21,000,000	1.75/FF	May-02	0	35,280	315,840	68,880	420,000	01A-0103	8/31/06	25,000,000	G.Eggs
											01A-0103	8/31/06	22,000,000	Fry
Coho Salmon: Kitoi Bay Hatchery Stock														
Kitoi Bay ^b	1,300,000	1,040	1,040,000	22.0/S	Jun-02	144,560	0	0	0	144,560	02A-0007	5/1/12	1,300,000	G. Eggs
											02A-0007	5/1/12	1,000,000	Smolt
Jennifer Lake	300,000	240	250,000	.75/FG	Jun-02	0	5,000	0	0	5,000	02A-0009	5/1/12	250,000	Fingerlings
Ruth Lake	60,000	48	30,000	.75/FG	Jun-02	0	600	0	0	600	02A-0011	5/1/12	50,000	Fingerlings
Crescent Lake	600,000	480	165,000	.75/FG	Jun-02	0	3,300	0	0	3,300	02A-0008	5/1/12	500,000	Fingerlings
Katmai Lake	30,000	24	15,000	7.0/PS	Oct-02	0	1,500	0	0	1,500	02A-0010	5/1/12	30,000	Fingerlings
Kitoi Bay	1,300,000	1,040	1,000,000	20.0/S	Jun-03	0	139,000	0	0	139,000	02A-0007	5/1/12	1,000,000	Smolt
Total Coho:	2,290,000	1,832	1,500,000			144,560	149,400	0	0	293,960				
Actual Total	2,520,431	10,630												
Sockeye Salmon: Saltery Lake Stock														
Little Kitoi Lake	306,903	250	250,000	11.0/PS	Oct-02	0	0	3,750	8,750	12,500	97A-0068	12/31/08	1,200,000	G.Eggs
LKL Outmigrants			160,000	10.0/PS	May-02		4,800	11,200		16,000	97A-0069	8/31/09	300,000	Presmolt
Grand Total:	230,278,666	370,490	164,910,000			5,114,560	189,480	324,390	77,630	5,712,460				

FF-Fed fry, FG-Fingerling, PS-Pre-smolt, S-Smolt

^a Assuming 3.5% ocean survival for pink salmon. Assuming 2.0% ocean survival for chum salmon and 8.4% as 0.2, 75.1% as 0.3, and 16.4% as 0.4 returning adults.

Assuming 50% survival from fall outstocking to spring outmigration, 10% ocean survival and 30% 1.2 and 70% 1.3 returning adults from Saltery sockeye stock.

^b Brood Year 2000.

Table 2. Salmon egg takes (2002), planned releases (2003-2004), projected returns (2004-2007), and fish transport permits (FTP), Kodiak Management Area.

Release Site	Egg Take		Releases			Adult Returns ^a					FTP			
	eggs	adults	Number	Size	Date	2004	2005	2006	2007	Total	Number	Expires	Maximum No.	Life Stage
Pink Salmon: Kitoi Bay Hatchery Stock														
Kitoi Bay	185,000,000	350,000	142,000,000	0.65/FF	May-03	4,970,000	0	0	0	4,970,000	01A-0102	8/30/06	215,000,000	G.Eggs
											01A-0102	8/30/06	182,000,000	Fry
Chum Salmon: Kitoi Bay Hatchery Stock														
Kitoi Bay	25,000,000	30,000	22,000,000	1.75/FF	May-03	0	36,960	330,880	72,160	440,000	01A-0103	8/31/06	25,000,000	G.Eggs
											01A-0103	8/31/06	22,000,000	Fry
Coho Salmon: Kitoi Bay Hatchery Stock														
Kitoi Bay	1,300,000	1,040	1,000,000	20.0/S	Jun-04	0	139,000	0	0	139,000	02A-0007	5/1/12	1,300,000	G. Eggs
											02A-0007	5/1/12	1,000,000	Smolt
Jennifer Lake	300,000	240	250,000	.75/FG	Jun-03	0	5,000	0	0	5,000	02A-0009	5/1/12	250,000	Fingerlings
Ruth Lake	60,000	48	50,000	.75/FG	Jun-03	0	1,000	0	0	1,000	02A-0011	5/1/12	50,000	Fingerlings
Crescent Lake	600,000	480	165,000	.75/FG	Jun-03	0	3,300	0	0	3,300	02A-0008	5/1/12	500,000	Fingerlings
Katmai Lake	40,000	24	15,000	7.0/PS	Oct-03	0	1,500	0	0	1,500	02A-0010	5/1/12	30,000	Presmolt
Total Coho:	2,300,000	1,832	1,480,000			0	149,800	0	0	149,800				
Expected brood:		6,000												
Sockeye Salmon: Saltery Lake Stock														
Little Kitoi Lake	300,000	250	250,000	11.0/PS	Oct-03	0	0	3,750	8,750	12,500	97A-0068	12/31/08	1,200,000	G.Eggs
											97A-0069	8/31/09	300,000	Presmolt
Grand Total:	212,600,000	382,082	165,730,000			4,970,000	186,760	334,630	80,910	5,572,300				

FF-Fed Fry, FG-Fingerling, PS-Presmolt, S-Smolt

^a Assuming 8.2% for 0.2, 83.1% for 0.3, and 8.7% for 0.4 chum salmon. Assuming 70% age 1.2 and 30% age 1.3 adults for LKL sockeye salmon stock. Assuming 30% for 1.2 and 70% for 1.3 returning adults from Saltery sockeye salmon stock.

Table 3. Kitoi Bay Hatchery minimum (desired) salmon escapement goals and projected brood numbers required, 2002.

	Minimum	Broodstock	Late-Run	Minimum	Adult
Big Kitoi Creek ^a	Escapement ^b	Required	Sockeye ^c	Escapement ^d	Escapement Required ^e
Pink	15,000	332,000	Saltery Lake	15,000	295
Chum	2,000	28,000			
Coho	0	6,000			
Little Kitoi Lake Coho	500	0			

^aBig Kitoi Creek is where adults returning to KBH imprint and enter the hatchery egg-take systems.

^bMinimum escapement refers to the number of adults remaining in the creek after KBH has completed the egg-takes. These fish are allowed entry into the creek to spawn to continue the run in the event of the loss of the hatchery rearing fish.

^cSince 1997, Saltery Lake is the brood source for the enhancement project at Spiridon and the Little Kitoi Lake broodstock program.

^dSaltery Lake Lower Biological Escapement Goal: egg take can proceed if this goal is reached or if the goal is not achieved, 1% of the spawning population may be used for the egg takes.

^eAdditional broodstock are also needed for Pillar Creek Hatchery (McCullough and Clevenger 2002).

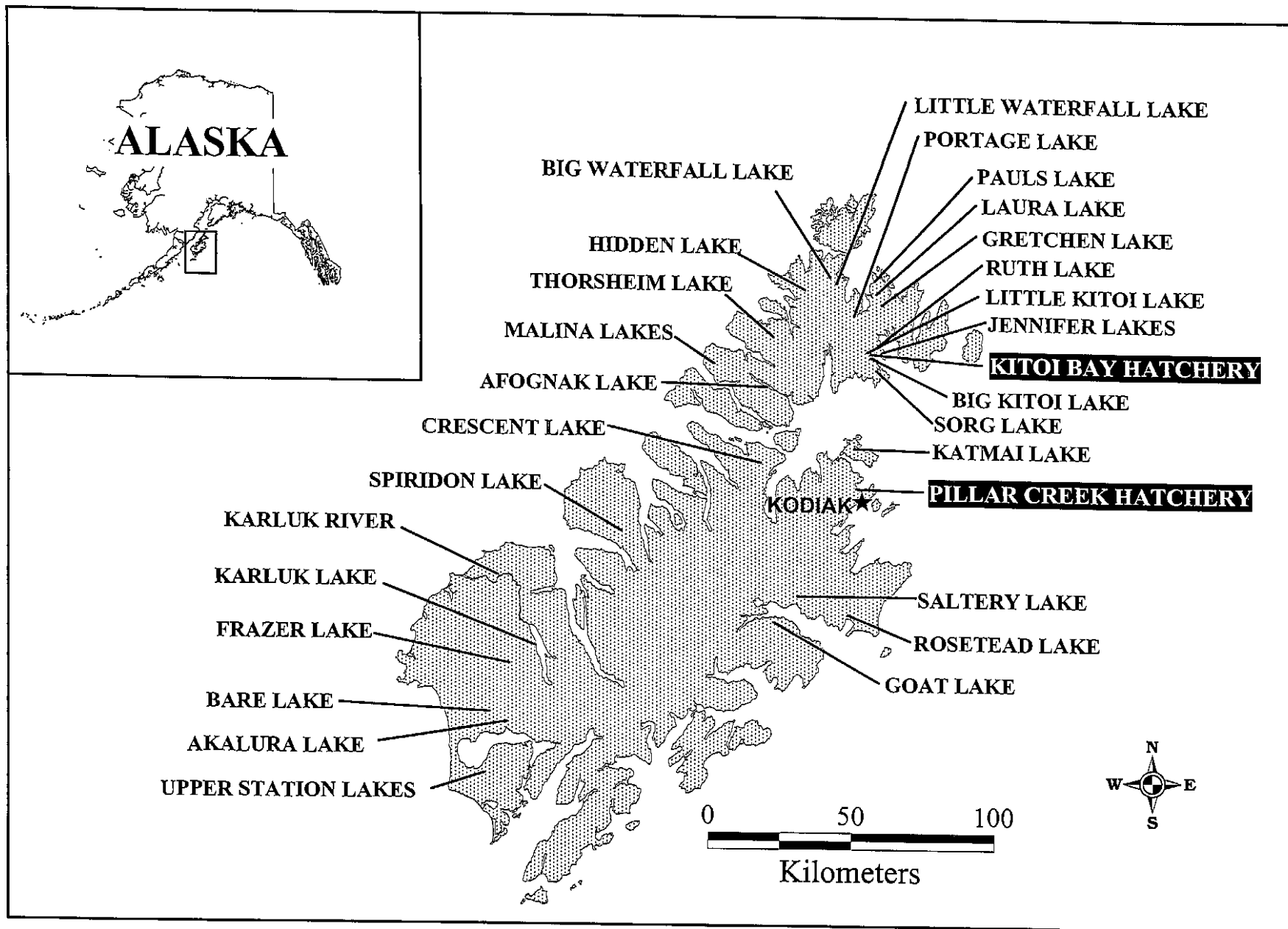


Figure 1. Locations of sockeye salmon enhancement and rehabilitation projects on Kodiak and Afognak Islands, 1951-2002.

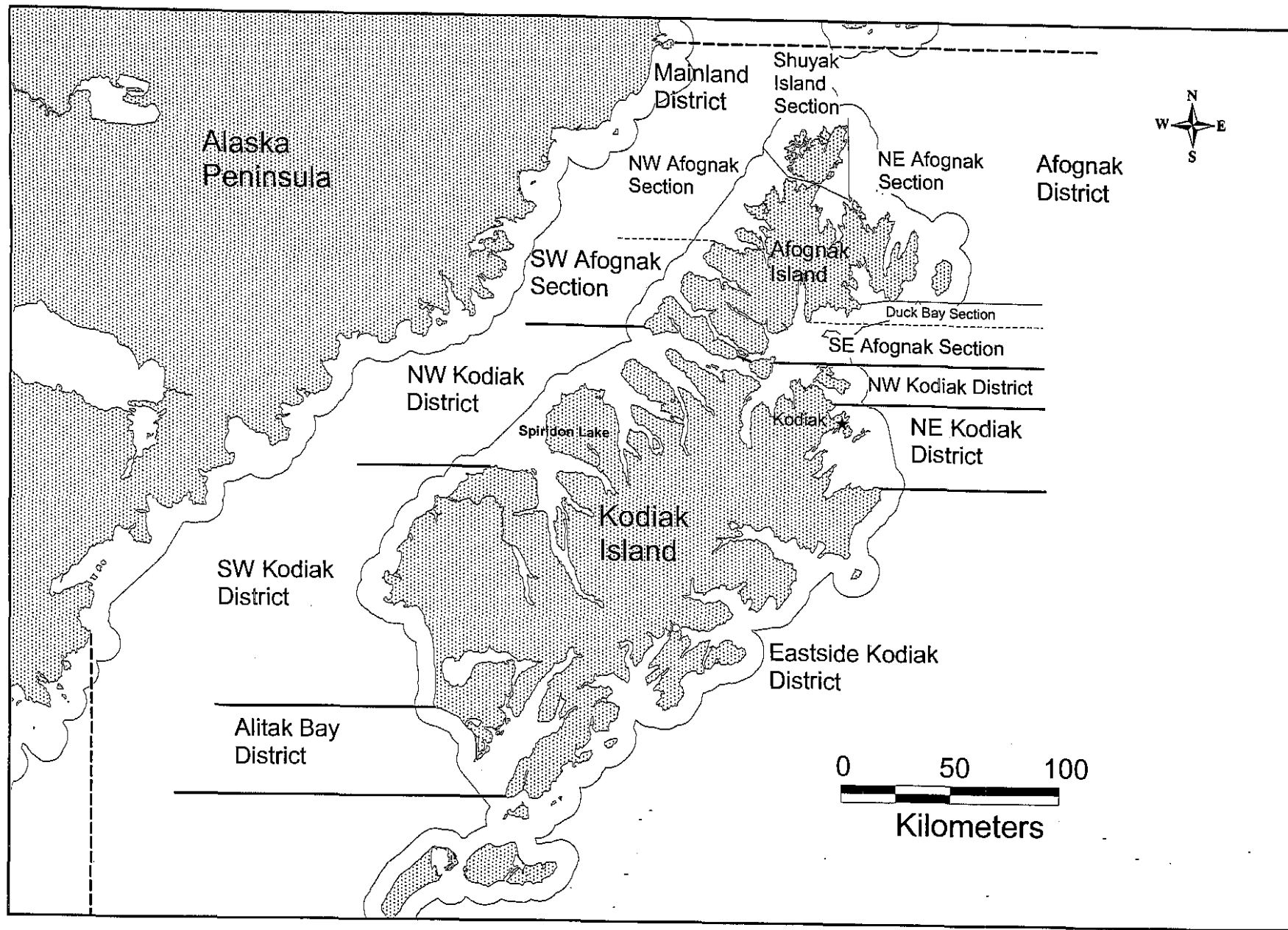


Figure 2. Map of the Kodiak Management Area depicting commercial fishing districts and selected sections.

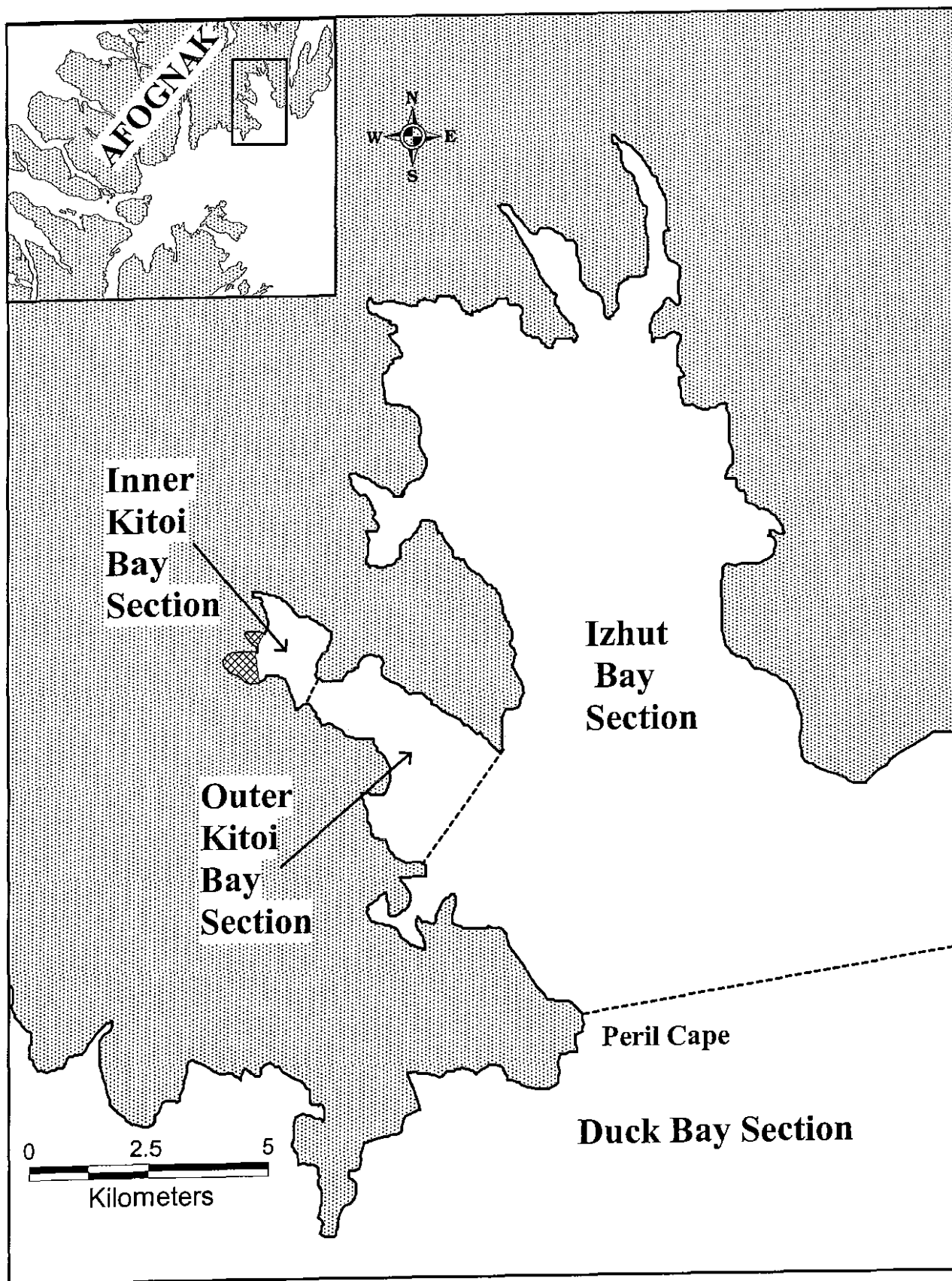


Figure 3. Map of Izhut (252-30), Duck (252-31), and Inner and Outer Kitoi Bay (252-32) Sections.

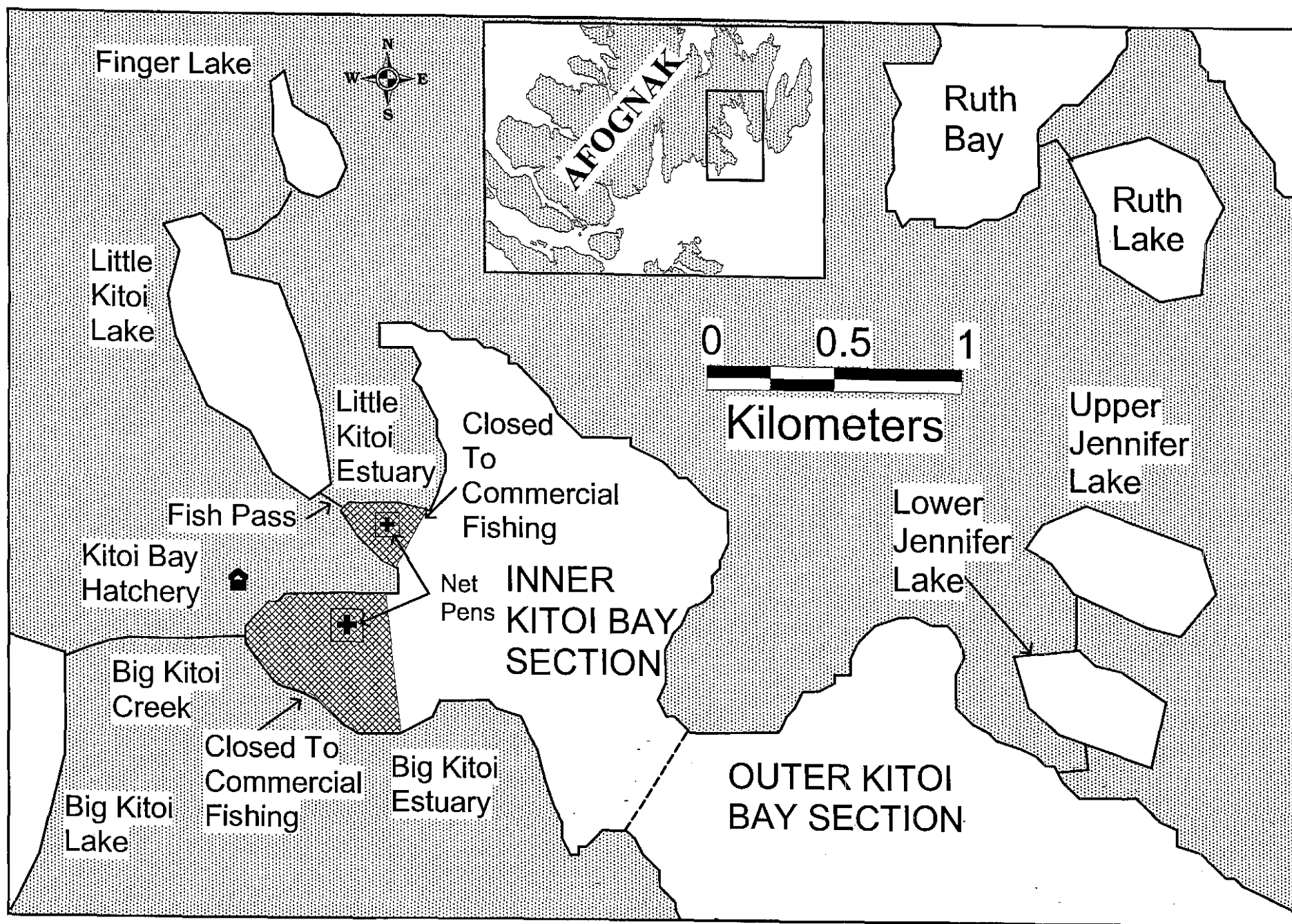


Figure 4. Map of Inner and Outer Kitoi Bay Sections (252-32).

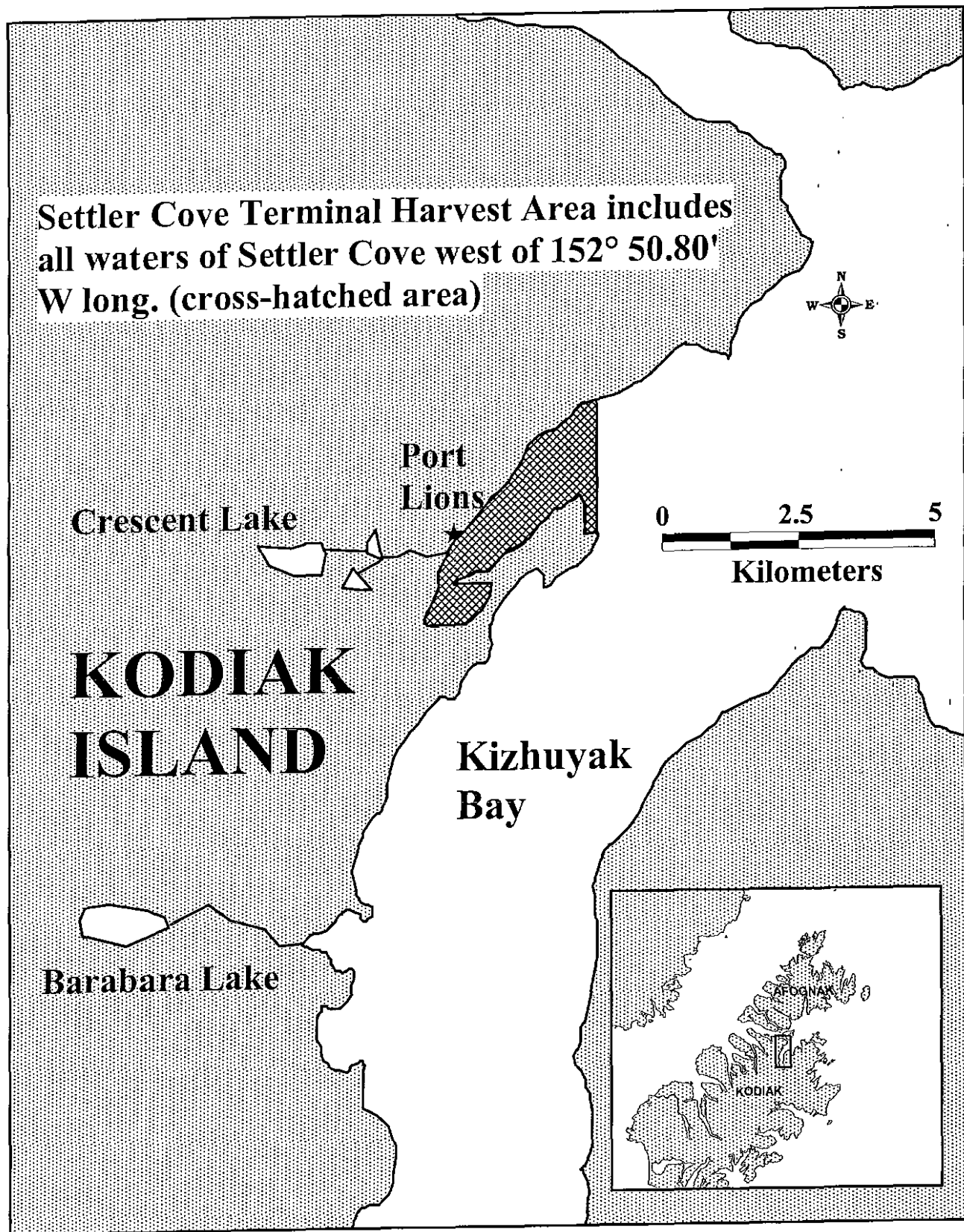


Figure 5. Settler Cove (Crescent Lake) terminal harvest area boundaries in Kizhuyak Bay, 2002.

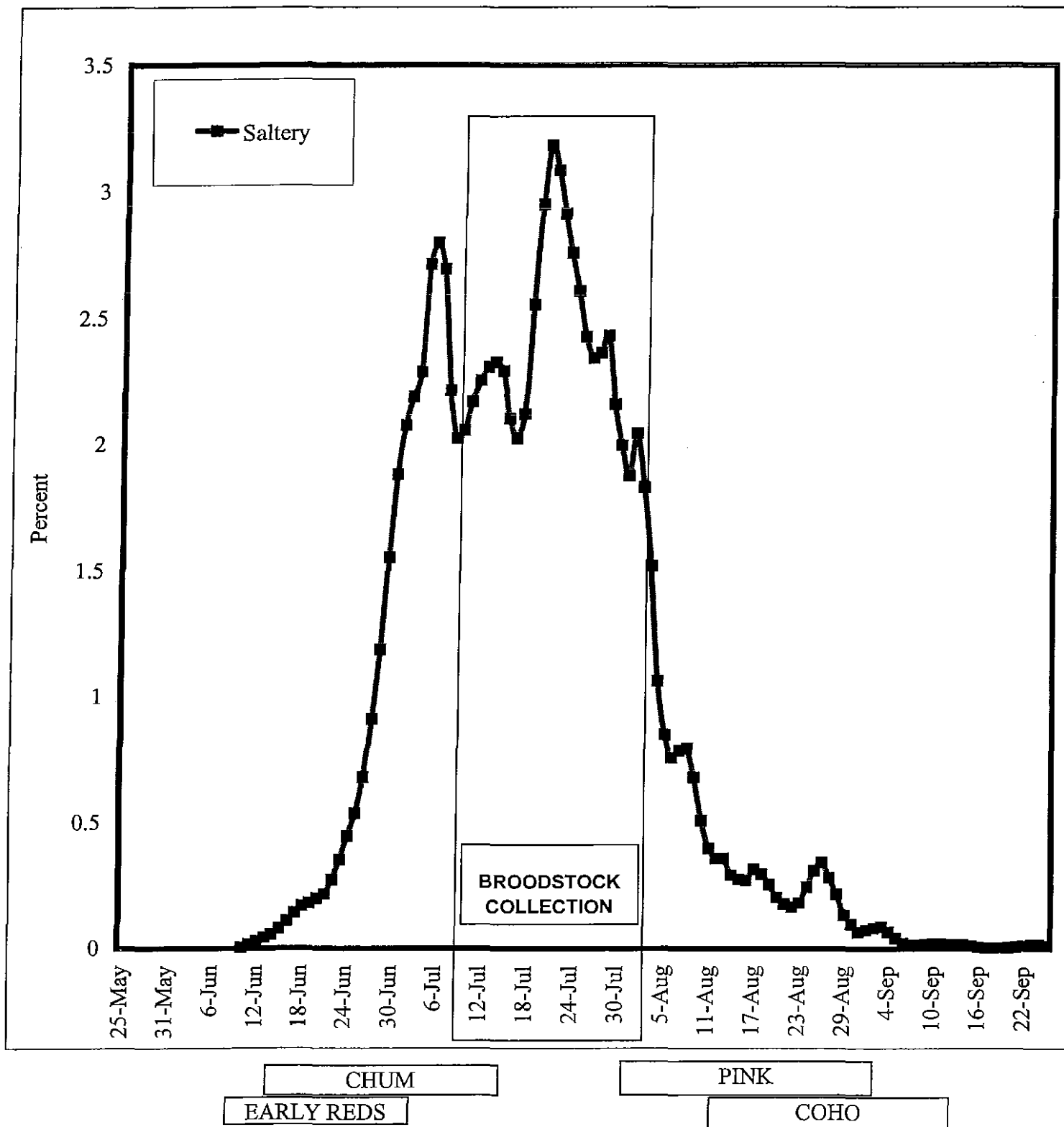


Figure 6. The run timing of salmon stocks returning to the Kitoi Bay Hatchery compared to the late-run Saltery sockeye salmon broodstock collection.

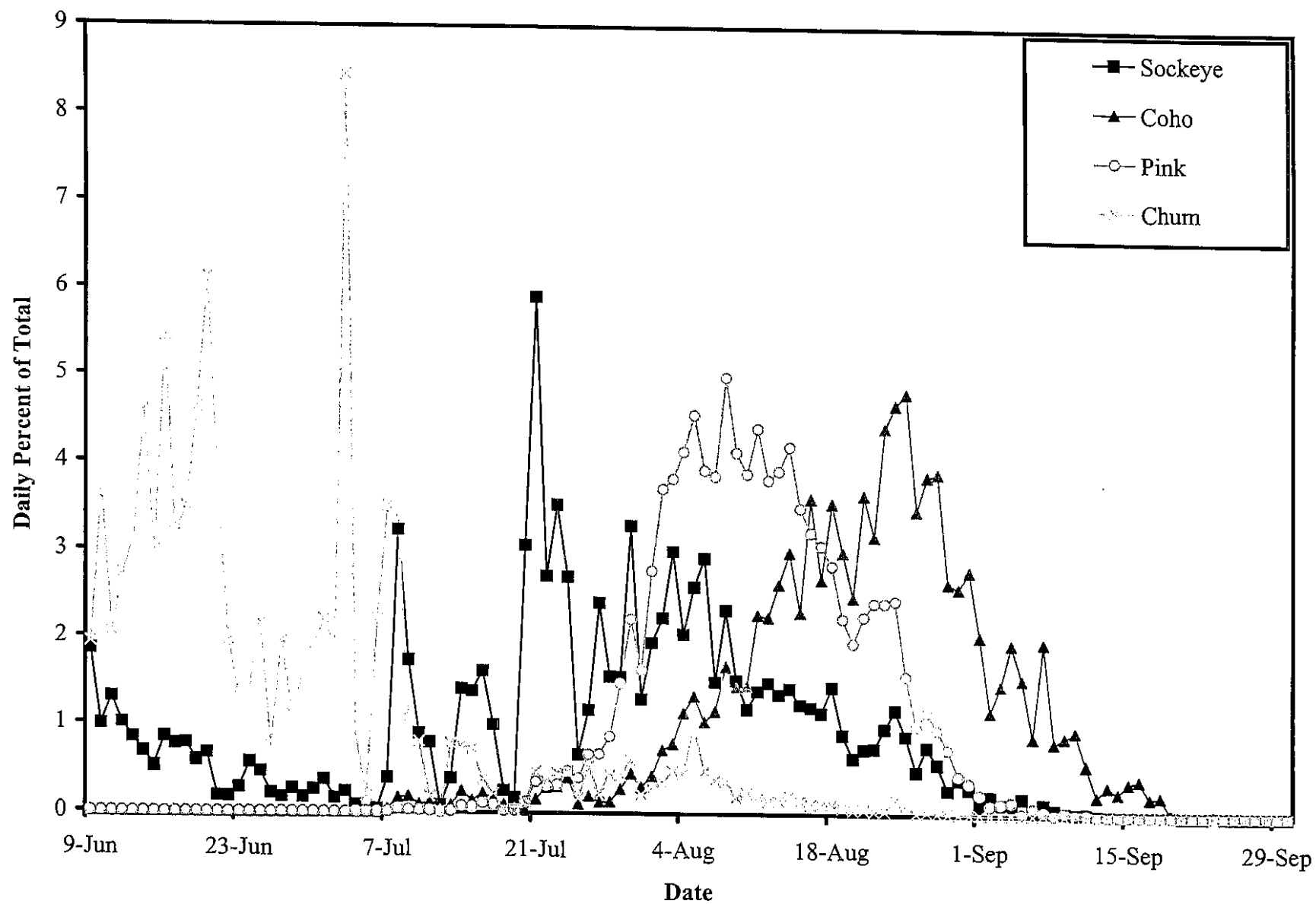


Figure 7. Sockeye, coho, pink, and chum salmon average (1992-2001) harvest timing in the combined Izhut, Duck, and Kitoi Bays Sections.

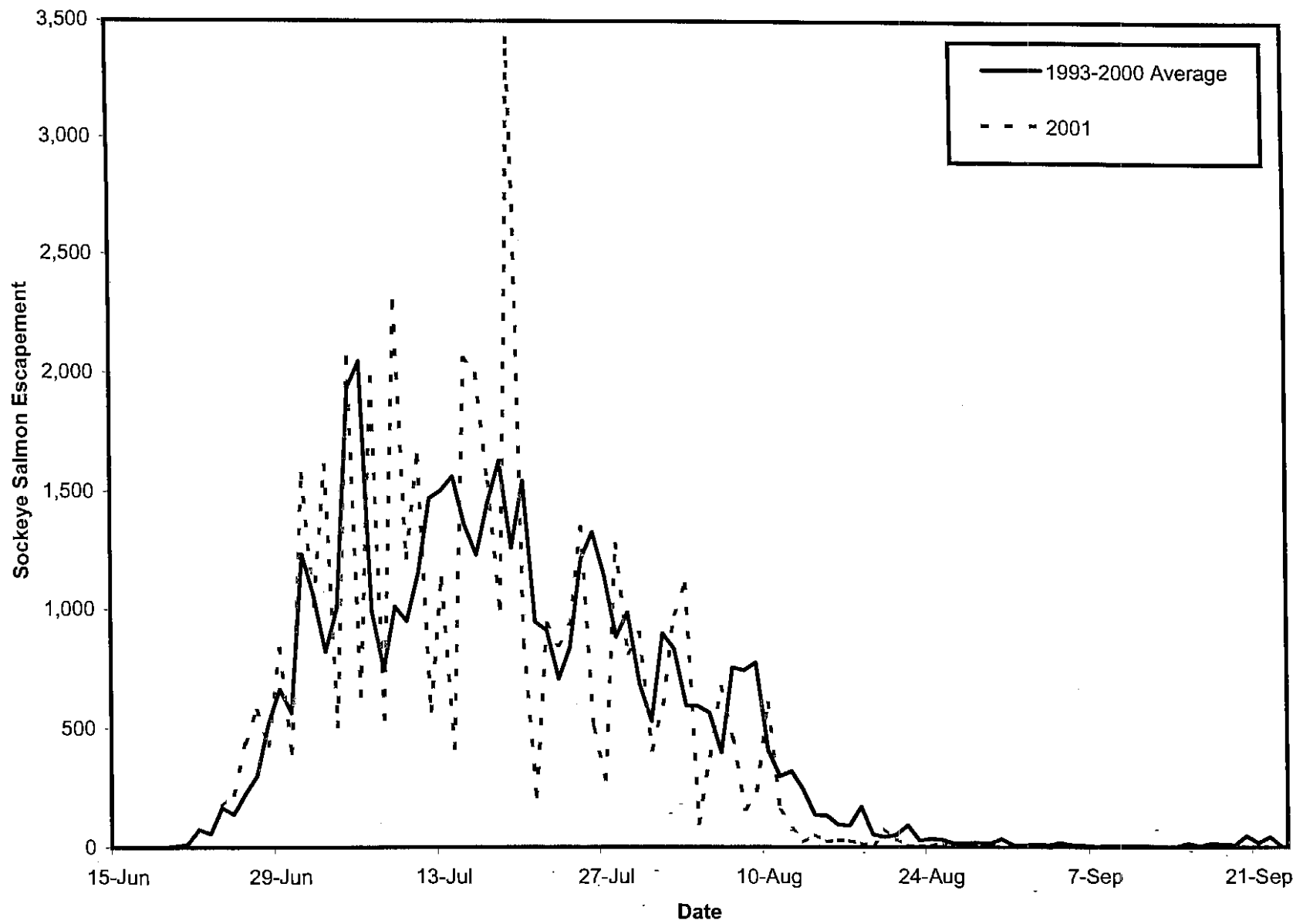


Figure 8. SALTERY LAKE sockeye salmon average escapement (1993-2000) compared to the 2001 escapement.

APPENDIX

Appendix A. Salmon survival assumptions used to estimate returns to Kitoi Bay Hatchery.

Species	Life Stage	Survival to Fry	
Pink	Egg	87.0%	
Chum	Egg	84.0%	

Species	Life Stage	Size (g)	Survival to Adult ^a	
			FW Release	SW Release
Pink	Fed Fry (FF)	0.7		3.6%
Chum	Fed Fry (FF)	1.75		2.0%
Coho	Fed Fry (FF) or Fingerling (FG)	0.75-1.5		2.0% - 6.0%
Coho	Fingerling (FG)	5.0-7.0	10.0%	
Coho	Age-1. Smolt (S)	20.0		13.9%
Sockeye	Presmolt (PS)	10.0	10.0%	

FW = Freshwater

SW = Saltwater

^a Based on known survivals from previous years releases and resultant returns.

Appendix B . Kitoi Bay Hatchery pink salmon release history, brood years 1972-2000.

Brood Year	Brood Stock	Number Released	Size at Release (g)	Life Stage	Release Location
1972	Big Kitoi Creek	493,130		Fry	Big Kitoi Creek
1973	Big Kitoi Creek	447,642		Fry	Big Kitoi Creek
1974	Big Kitoi Creek	1,226,314		Fry	Big Kitoi Creek
1975	Big Kitoi Creek	2,486,410		Fry	Big Kitoi Creek
1976	Big Kitoi Creek	4,722,152	0.50	Fry	Big Kitoi Creek
1977	Big Kitoi Creek	17,255,424	0.44	Fry	Big Kitoi Creek
1978	Big Kitoi Creek	17,319,537		Fry	Big Kitoi Creek
1979	Big Kitoi Creek	22,458,947	0.63	Fry	Big Kitoi Creek
1980	Big Kitoi Creek	26,351,664	0.93	Fry	Big Kitoi Creek
1981	Big Kitoi Creek	47,828,701		Fry	Big Kitoi Creek
1982	Big Kitoi Creek	72,054,096	0.79	Fry	Big Kitoi Creek
1983	Big Kitoi Creek	87,065,569	0.58	Fry	Big Kitoi Creek
1984	Big Kitoi Creek	75,109,442	0.29	Fry	Big Kitoi Creek
1985	Big Kitoi Creek	97,773,052	0.78	Fry	Big Kitoi Creek
1986	Big Kitoi Creek	90,017,823	0.27	Fry	Big Kitoi Creek
1987	Big Kitoi Creek	94,172,516	0.73	Fry	Big Kitoi Creek
1988	Big Kitoi Creek	80,502,220	0.62	Fry	Big Kitoi Creek
1989	Big Kitoi Creek	84,907,550	0.61	Fry	Big Kitoi Creek
1990	Big Kitoi Creek	124,148,019	0.60	Fry	Big Kitoi Creek
1991	Big Kitoi Creek	147,145,130	0.80	Fry	Big Kitoi Creek
1992	Big Kitoi Creek	169,552,112	0.51	Fry	Big Kitoi Creek
1993	Big Kitoi Creek	163,192,575	0.45	Fry	Big Kitoi Creek
1994	Big Kitoi Creek	134,104,406	0.53	Fry	Big Kitoi Creek
1995	Big Kitoi Creek	144,045,245	0.48	Fry	Big Kitoi Creek
1996	Big Kitoi Creek	102,583,724	0.50	Fry	Big Kitoi Creek
1997	Big Kitoi Creek	128,101,460	0.50	Fry	Big Kitoi Creek
1998	Big Kitoi Creek	127,685,500	0.54	Fry	Big Kitoi Creek
1999	Big Kitoi Creek	137,702,154	0.61	Fry	Big Kitoi Creek
2000	Big Kitoi Creek	134,823,670	0.72	Fry	Big Kitoi Creek

Appendix C . Kitoi Bay Hatchery chum salmon release history, brood years 1981-2000.

Brood Year	Return Year	Brood Stock	Number Released	Size at Release (g)	Life Stage	Release Location
1981	1983,84,85,86	Sturgeon River	36,846	0.56	Fry	Big Kitoi Creek
1982	1984,85,86,87	Sturgeon River	105,058	1.05	Fry	Big Kitoi Creek
1983	1985,86,87,88	Sturgeon River	630,422	1.16	Fry	Big Kitoi Creek
1984	1986,87,88,89	Sturgeon River	784,078	0.67	Fry	Big Kitoi Creek
1985	1987,88,89,90	Sturgeon River	414,233		Fry	Big Kitoi Creek
1986	1988,89,90,91	Big Kitoi Creek	693,166	2.00	Fry	Big Kitoi Creek
1987	1990,91,92,93	Big Kitoi Creek	4,737,587	2.10	Fry	Big Kitoi Creek
1988	1991,92,93,94	Big Kitoi Creek	3,289,878	1.85	Fry	Big Kitoi Creek
1989	1992,93,94,95	Big Kitoi Creek	1,502,501	2.44	Fry	Big Kitoi Creek
1990	1993,94,95,96	Big Kitoi Creek	0		Fry	Big Kitoi Creek
1991	1994,95,96,97	Big Kitoi Creek	22,214,472	1.80	Fry	Big Kitoi Creek
1992	1995,96,97,98	Big Kitoi Creek	10,101,986	2.02	Fry	Big Kitoi Creek
1993	1996,97,98,99	Big Kitoi Creek	6,507,497	1.52	Fry	Big Kitoi Creek
1994	1997,98,99,00,	Big Kitoi Creek	9,738,472	1.51	Fry	Big Kitoi Creek
1995	1998,99,00,01	Big Kitoi Creek	20,139,843	1.27	Fry	Big Kitoi Creek
1996	1999,00,01,02	Big Kitoi Creek	23,500,000	1.50	Fry	Big Kitoi Creek
1997	2000,01,02,03	Big Kitoi Creek	12,310,015	1.50	Fry	Big Kitoi Creek
1998	2001,02,03,04	Big Kitoi Creek	6,859,982	1.02	Fry	Big Kitoi Creek
1999	2002,03,04,05	Big Kitoi Creek	22,334,640	1.70	Fry	Big Kitoi Creek
2000	2003,04,05,06	Big Kitoi Creek	20,032,140	1.73	Fry	Big Kitoi Creek

Appendix D. Kitoi Bay Hatchery coho salmon release history, brood years 1982-2000.

Brood Year	Return Year	Brood Stock	Number Released	Size at Release (g)	Life Stage	Release Location
1982	1985	Buskin	77,348	0.85	Fingerling	Buskin Lake
1983	1986	Buskin	43,288	0.64	Fingerling	Buskin Lake
1983	1986	Little Kitoi Lake	131,825	0.96	Fingerling	Kodiak Road System
1983	1986	Little Kitoi Lake	5,000	2.54	Fingerling	Shemya
1983	1986	Little Kitoi Lake	127,700	1.00	Fingerling	Little Kitoi Lake
1984	1987	Buskin	45,645	1.88	Fingerling	Buskin Lake
1984	1987	Little Kitoi Lake	109,568	0.90	Fingerling	Kodiak Road System
1984	1987	Little Kitoi Lake	33,472	1.50	Fingerling	Little Kitoi Lake
1984	1987	Little Kitoi Lake	12,731	2.60	Fingerling	Kodiak Road System
1985	1988	Buskin	50,024	0.79	Fingerling	Buskin Lake
1985	1988	Little Kitoi Lake	141,750	1.08	Fingerling	Kodiak Road System
1985	1988	Little Kitoi Lake	53,360	6.10	Presmolt	Little Kitoi Lake
1986	1989	Little Kitoi Lake	103,824	1.03	Fingerling	Kodiak Road System
1986	1989	Little Kitoi Lake	171,103	1.79	Fingerling	Little Kitoi Lake
1986	1989	Little Kitoi Lake	9,600	5.00	Presmolt	Big Kitoi Creek
1986	1989	Little Kitoi Lake	22,349	0.50	Fingerling	Katmai Creek
1987	1990	Little Kitoi Lake	84,600	1.18	Fingerling	Kodiak Road System
1987	1990	Little Kitoi Lake	43,807	1.52	Fingerling	Little Kitoi Lake
1987	1990	Little Kitoi Lake	241,373	1.13	Fingerling	Crescent Lake
1987	1990	Little Kitoi Lake	20,000	0.70	Fingerling	Katmai Creek
1987	1990	Little Kitoi Lake	137,585	1.13	Fingerling	Hidden Lake
1988	1991	Little Kitoi Lake	87,585	0.80	Fingerling	Kodiak Road System
1988	1991	Little Kitoi Lake	137,493	23.30	Smolt	Big Kitoi Creek
1988	1991	Little Kitoi Lake	202,955	0.82	Fingerling	Crescent Lake
1988	1991	Little Kitoi Lake	239,817	0.85	Fingerling	Hidden Lake
1989	1992	Little Kitoi Lake	36,040	1.75	Fingerling	Kodiak Road System
1990	1993	Little Kitoi Lake	83,530	1.24	Fingerling	Kodiak Road System
1990	1993	Little Kitoi Lake	60,755	32.00	Smolt	Big Kitoi Creek
1990	1993	Little Kitoi Lake	191,416	1.10	Fingerling	Crescent Lake
1990	1993	Little Kitoi Lake	250,889	1.25	Fingerling	Hidden Lake
1991	1994	Little Kitoi Lake	51,500	1.60	Fingerling	Kodiak Road System
1991	1994	Little Kitoi Lake	15,200	8.00	Presmolt	Kodiak Road System
1991	1994	Little Kitoi Lake	69,100	7.04	Presmolt	Crescent Lake
1991	1994	Little Kitoi Lake	14,973	8.00	Presmolt	Katmai Lake
1991	1994	Little Kitoi Lake	162,387	4.50	Fingerling	Jennifer Lakes
1991	1994	Little Kitoi Lake	70,605	1.40	Fingerling	Little Kitoi Lake

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Appendix D. (page 2 of 3)

Brood Year	Return Year	Brood Stock	Number Released	Size at Release (g)	Life Stage	Release Location
1991	1994	Little Kitoi Lake	613,681	18.90	Smolt	Big Kitoi Creek
1992	1995	Little Kitoi Lake	64,000	1.76	Fingerling	Kodiak Road System
1992	1995	Little Kitoi Lake	68,420	14.60	Presmolt	Crescent Lake
1992	1995	Little Kitoi Lake	15,052	14.60	Presmolt	Katmai Lake
1992	1995	Little Kitoi Lake	135,486	1.94	Fingerling	Jennifer Lakes
1992	1995	Little Kitoi Lake	139,147	1.30	Fingerling	Little Kitoi Lake
1992	1995	Little Kitoi Lake	5,163	14.60	Presmolt	Big Kitoi Creek
1992	1995	Little Kitoi Lake	97,973	28.40	Smolt	Big Kitoi Creek
1993	1996	Big Kitoi Creek	163,680	0.98	Fingerling	Crescent Lake
1993	1996	Big Kitoi Creek	13,178	23.28	Presmolt	Katmai Lake
1993	1996	Big Kitoi Creek	258,926	25.90	Smolt	Big Kitoi Creek
1994	1997	Big Kitoi Creek	167,778	1.16	Fingerling	Crescent Lake
1994	1997	Big Kitoi Creek	165,000	1.46	Fingerling	Jennifer Lakes
1994	1997	Big Kitoi Creek	59,500	1.74	Fingerling	Ruth Lake
1994	1997	Big Kitoi Creek	28,350	2.41	Fingerling	Finger Lake
1994	1997	Big Kitoi Creek	59,030	2.50	Fingerling	Elk Lake
1994	1997	Big Kitoi Creek	16,489	5.87	Presmolt	Katmai Lake
1994	1997	Big Kitoi Creek	894,486	23.54	Smolt	Big Kitoi Creek
1995	1998	Big Kitoi Creek	163,200	0.40	Fry	Crescent Lake
1995	1998	Big Kitoi Creek	15,246	5.04	Presmolt	Katmai Lake
1995	1998	Big Kitoi Creek	819,046	19.57	Smolt	Big Kitoi Creek
1996	1999	Big Kitoi Creek	35,000	0.35	Fry	Ruth Lake
1996	1999	Big Kitoi Creek	163,000	0.35	Fry	Jennifer Lakes
1996	1999	Big Kitoi Creek	165,000	0.35	Fry	Crescent Lake
1996	1999	Big Kitoi Creek	15,735	7.33	Presmolt	Katmai Lake
1996	1999	Big Kitoi Creek	769,000	23.90	Smolt	Big Kitoi Creek
1997	2000	Big Kitoi Creek	163,000	0.60	Fry	Crescent Lake
1997	2000	Big Kitoi Creek	35,000	0.50	Fry	Ruth Lake
1997	2000	Big Kitoi Creek	165,000	0.50	Fry	Jennifer Lakes
1997	2000	Big Kitoi Creek	1,098,338	19.30	Smolt	Big Kitoi Creek
1998	2001	Big Kitoi Creek	35,000	0.57	Fry	Ruth Lake
1998	2001	Big Kitoi Creek	136,000	0.55	Fry	Jennifer Lake
1998	2001	Big Kitoi Creek	165,000	0.57	Fry	Crescent Lake
1998	2001	Big Kitoi Creek	15,000	8.23	Presmolt	Katmai Lake
1998	2001	Big Kitoi Creek	871,448	16.92	Smolt	Big Kitoi Creek

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Appendix D. (page 3 of 3)

Brood Year	Return Year	Brood Stock	Number Released	Size at Release (g)	Life Stage	Release Location
1999	2002	Big Kitoi Creek	30,695	0.72	Fry	Ruth Lake
1999	2002	Big Kitoi Creek	155,688	0.44	Fry	Jennifer Lake
1999	2002	Big Kitoi Creek	165,837	0.42	Fry	Crescent Lake
1999	2002	Big Kitoi Creek	15,000	7.40	Presmolt	Katmai Lake
2000	2003	Big Kitoi Creek	936,913	20.76	Smolt	Big Kitoi Creek
2000	2003	Big Kitoi Creek	120,000	0.86	Fry	Jennifer Lake
2000	2003	Big Kitoi Creek	165,000	0.90	Fry	Crescent Lake
2000	2003	Big Kitoi Creek	15,000	8.37	Presmolt	Katmai Lake

Appendix E. Kitoi Bay Hatchery sockeye salmon release history, brood years 1988-2000.

Brood Year	Brood Stock	Number Released	Size at Release (g)	Life stage	Release Location
1988	Upper Station	143,725	2.48	Zero Check Smolt	Little Kitoi Bay
1989	Upper Station	249,346	0.20	Fry	Spiridon
		241,000	0.50	Fingerling	Little Kitoi Lake
		337,932	0.18	Fry	Little Kitoi Lake
		854,610	3.23	Zero Check Smolt	Little Kitoi Bay
		458,118	0.48	Zero Check Fingerling	Little Kitoi Bay
1990	Upper Station	1,250,000	2.50	Zero Check Smolt	Little Kitoi Bay
1991	Upper Station	1,463,000	1.60	Zero Check Smolt	Little Kitoi Bay
1992	Upper Station	52,418	3.13	Presmolt	Little Kitoi Lake
		180,000	0.50	Fingerling	Jennifer Lakes
		326,500	15.00	Smolt	Little Kitoi Bay
1993	Upper Station	1,672,710	1.11	Zero Check Smolt	Little Kitoi Bay
	Little Kitoi Lake	10,108	4.60	Presmolt	Little Kitoi Lake
		916,677	10.08	Smolt	Little Kitoi Bay
1994	Upper Station	266,952	1.83	Zero Check Smolt	Little Kitoi Lake
	Little Kitoi Lake	84,861	4.98	Presmolt	Little Kitoi Lake
		573,242	12.70	Smolt	Little Kitoi Bay
1995	Little Kitoi Lake	155,687	3.16	Presmolt	Little Kitoi Lake
	Upper Station	587,435	12.10	Smolt	Little Kitoi Bay
1996	Little Kitoi Lake	77,039	3.31	Presmolt	Little Kitoi Lake
	Little Kitoi Lake	99,085	11.70	Presmolt	Little Kitoi Lake
	Little Kitoi Lake	397,000	15.10	Smolt	Little Kitoi Bay
1997	Saltery Lake	106,658	17.70	Smolt	Little Kitoi Lake
1998	Saltery Lake	98,737	7.00	Fingerling	Little Kitoi Lake
		74,463	14.63	Presmolt	Little Kitoi Lake
		23,756	14.35	Presmolt	Little Kitoi Bay ^a
1999	Saltery Lake	154,039	11.31	Presmolt	Little Kitoi Lake
2000	Saltery Lake	282,089	9.53	Presmolt	Little Kitoi Lake

^a This release resulted from a dissolved oxygen crash in the transfer tank.

Appendix F. Little Kitoi Lake sockeye salmon egg takes, and eggs incubated and reared at Kitoi Bay Hatchery, 1993-1996.

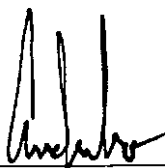
Brood Year	Number Adults	Eggs (millions)	Number Released	Year Stocked	Life Stage	Stocking Location
1993	1,050	1.10	10,108	1994	Presmolt	Little Kitoi Lake
			916,677	1995	Smolt	Little Kitoi Bay
1994	600	1.50	84,861	1995	Presmolt	Little Kitoi Lake
			573,242	1996	Smolt	Little Kitoi Bay
1995	155	0.19	155,687	1996	Presmolt	Little Kitoi Lake
1996	1,210	1.20	77,039	1997	Presmolt	Little Kitoi Lake
			99,085	1998	Presmolt	Little Kitoi Lake

Appendix G. Estimated run and harvest of salmon returning to systems in 2002 as a result of prior Kitoi Bay Hatchery stockings.

Return Location	Species	Run	Range	Harvest
Kitoi Bay Hatchery	Pink	4,827,000	3,000,000 - 6,400,000	4,500,000
	Chum	108,200	82,000 - 144,000	78,000
	Coho	133,195	89,000 - 177,000	127,000
Little Kitoi Lake	Sockeye ^a	7,300	3,700 - 12,900	7,300
Crescent Lake	Coho	6,600	3,300 - 9,900	6,600
Katmai Creek	Coho	1,500	800 - 2,200	1,500

^a An estimated 2,800 of these sockeye salmon will be of Saltery Lake stock; an additional 900 early-run sockeye salmon from Pillar Creek Hatchery releases are also expected to return in 2002. (S. Honnold, ADF&G, Kodiak, personal communication)

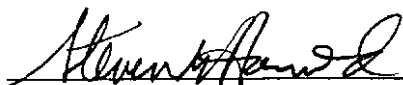
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Andrew Aro: Kitoi Bay Hatchery Manager, KRAA

7/11/02

Date



Steve Honnold: Kodiak Finfish Research Biologist, CFD

6/27/02

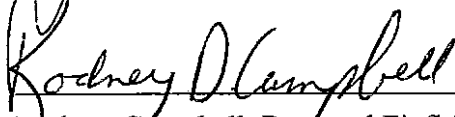
Date



Jim McCullough: Regional Resource Development Biologist, CFD

6/27/02

Date



Rodney Campbell: Regional Finfish Management Supervisor, CFD

6/27/02

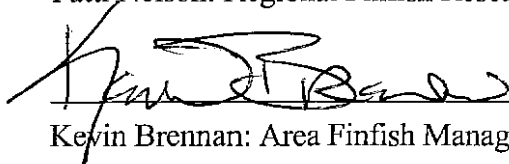
Date



Patti Nelson: Regional Finfish Research Supervisor, CFD

6/27/02

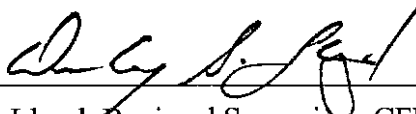
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Kevin Brennan: Area Finfish Management Biologist, CFD

6-27-02

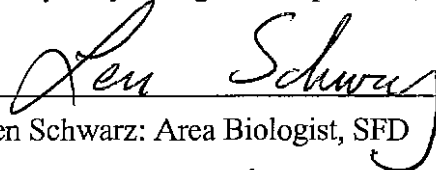
Date



Denby Lloyd: Regional Supervisor, CFD

27 June 02

Date



Len Schwarz: Area Biologist, SFD

7/03/02

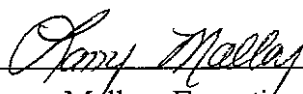
Date



Robert Clark: Regional Supervisor, SFD

7/9/02

Date



Larry Malloy: Executive Director, KRAA

07.03.02

Date

The 2002 Hatchery Management Plan for KBH is hereby approved:



Robert Bosworth: Deputy Commissioner, ADF&G

7.15.02

Date